# THE MARINE RECORD.

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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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## NEWLY ENROLLED TONNAGE.

Following is a list of lake vessels to which official numbers and signal letters have been assigned by the Commissioner of Navigation, for the week ended Aug. 10:

| Official No. | Rig. | Name. | TONNAGE. Gross. | Net. | Home Port. | Where Built. |
|---|---|---|---|---|---|---|
| 127,102 | Sch. y | Clipper | 7.39 | 7.33 | Cleveland | Port Clinton |
| 141 396 | St. y s | Lorella | 9 23 | 6.28 | Buffalo | Buffalo |
| 150 705 | St. s. | Penobscot | 3.502.28 | 2 864 63 | Port Huron | W. Bay City |
| 116 689 | St. s. | Stone City | 42.01 | 34 70 | Chicago | Lockport Ill. |

## JUST PUBLISHED.

The new Hydrographic Office Chart of Lakes Erie and Ontario, is something no master sailing the lower lakes can afford to be without. It contains the latest information regarding depths of water, compass variation, lights and fog signals, and includes Lake St. Clair and St. Clair and Detroit Rivers, besides the lower end of Lake Huron, the southern part of Georgian Bay and all of Saginaw Bay. These charts can be obtained at the office of THE MARINE RECORD, No. 144 Superior street, Cleveland, at 75 cents each.

## THE COAL OUT-LOOK.

The prospects of the coal trade, says Black Diamond, are growing brighter. Inquiry is more active, and orders are fairly plentiful. Of course, the question of prices is still the *bete noir* of the industry. However, with the approach of the winter season and the disposition of an ever-increasing tonnage, and with an adherence to the line laid down in the producing regions and a prospective harmonization of the conflict of elements in the trade, we may look to improvement even in this direction. One matter is very evident, and that is this, that stocks, and in this connection we refer not to coal stocks, but to railroad stocks, are being affected to a degree that render it beyond all dispute that some kind of an arrangement will have to be come to before very long, or otherwise the situation will take on an aspect, so far as financial interests are concerned, which will not be only serious, for it is that now, but also dangerous. We may, therefore, look for the operation of what might technically be called outside factors to bring about a solution.

Buyers are becoming more anxious with regard to future prospects, and are seeking to lay in stocks at what they evidently recogonize now to be bottom prices. Coal men, however, do not seem particularly anxious to give very long credits, and this is calculated to guard them against many contingent losses. There is every reason to believe that neither dealers' or consumers' stocks of the East or West are as large as usual at this period of the year, and it is possible that some shippers are selling more coal than they really have on hand.

The western hard coal trade also shows signs of rallying, with a tendency toward stiffening in prices. They have certainly been lower of late than has been the case for a long period, but the demand grows stronger, and the amount of coal which is being disposed of to the dealers is reaching quite a tonnage, while receipts on the other hand show considerable decrease on the figures of last year. In 1894 the lake receipts at Chicago for interests for the month of July were 131,000 odd tons as against 93,000 odd tons for 1895, 38,000 tons decrease, and the receipts of rail for the same period were 56,000 tons in 1894 against 41,000 in 1895, a decrease of 15,000 tons. making altogether a decrease in the month of July in hard coal receipts at Chicago of over 50,000 tons. These figures speak for themselves, and with an increase in the volume of business are calculated to considerably relieve the pressure of a surplusage.

It is reported that the railroad coal operators of the Pittsburgh district have a well-defined plan to form an association of all the interests into one large company, the general purpose of which would be to take care of the entire output of all the rail mines in the Pittsburgh district on a basis of thirty cents a ton to the operators for all coal mined.

The Ohio trade has undergone no change from the last reports, and although the shipments to Chicago and similiar points is not encouraging, the outlook in other directions is by no means so gloomy as it has been. Ohio coal has before it a distinct future of its own, and may be said to be in a commanding position for the control of what may be called its own territory. The production of the Buckeye state last year amounted to nearly 12,000,000 tons, which was somewhat of a falling off from last 1893, owing to the strike and other injurious causes. The prominent part which machinery is playing in the mining of coal is shown in the fact that two and one-half million tons were mined in this way. In a table prepared to show the late tonnage from Ohio, Pennsylvania and West Virginia, it is demonstrated that at the several lake ports, some 5,400,000, tons of bituminous coal was received, which is a gain of 800,000 tons of coal as compared with the year before. Thirty per cent of this amount came from the Ohio mines, and some 65 per cent from the Pennsylvania mines, a considerable ncrease for the latter.

## A POWERFUL FLOATING DERRICK.

The most powerful floating derrick ever constructed was tested at Hell Gate recently. It was built for the Chapman Wrecking Co. by the Morse Iron Works, South Brooklyn. The lifting power is estimated at 300 tons. This big derrick is named "The Hell Gate," and its hull is 145 feet in length, 50 feet in beam and 15 feet deep. As the lifting will be chiefly done on the port side, the starboard is fitted with 13 iron tanks which, filled with water, will form a counterbalance. The A frame stands 112 feet above deck and supports a boom 98 feet long, about 20 feet of which is outboard. The main legs of the former are of wrought iron and are 3 feet 4 inches by 3 feet at the base. The auxiliary legs back of these are 2 feet 3 inches by 2 feet, the whole weighing over 70 tons. In the center the boom measures 6 feet by 3 feet 4 inches, and weighs 35½ tons. Some idea of the size of the block carrying the main purchase may be formed from the fact that it weighs 5½ tons. The block through which the topping lift runs weighs 5 tons. Both carry six-fold purchases. Besides these two, a pair of smaller auxiliary blocks, each with a four-fold purchase, are on the end of the boom. The main cable is of 1⅝ inches steel wire. These lifts are operated by ten drums. There are three double engines, one pair horizontal and two pairs vertical, worked by two large upright boilers. The big A frame is supported by 20 backstays of 2-inch steel wire fastened by turn-buckles to the chain plates on the after ends and stern of the hull. The anchor cables are also of steel rope each 800 feet long. The completed structure will cost $150,000.

## NATIONALITY OF SEAMEN.

The shipments of seamen on American vessels at the seaports of the United States during the fiscal year ended June 30 last, according to the returns of the United States Shipping Commissioners, show an aggregate of 79,415 men, which is an increase of 8,000 over the previous year for the whole country, 7,100 of this increase being at New York. By nativity the figures were: 24,182 Scandinavians, 21,881 Americans, 11,552 British, 11,057 Germans, 871 French, 1,370 Italians, 1,047 Russian Finns, and 7,455 other nationalities. Compared with the previous year, Americans show a decrease of 250; Scandinavians an increase of 2,000. Other nationalities also show an increase.

# NEWS AROUND THE LAKES.

## CLEVELAND.

The proposed cut in the west arm of the breakwater has been pretty thoroughly blasted out, and the government dredge Maumee is expected down from Detroit inside of a week to take out the debris.

Harry B. Strong has sold the fishing tug W. W. Richardson to Harvey J. Kendall and others, of Port Huron.

General Supt. S. I. Kimball and District Supt. E. E. Chapman, of the life-saving service, visited the local station this week. A number of improvements are planned.

The little steamer Trio, of Port Clinton, has been engaged by State Game Warden Buntain to watch the fishermen, and she is patroling the Ohio coast. It is probable that some sort of an agreement will be reached which will render this unnecessary after a few weeks.

The yacht Neva was libeled at Sandusky Tuesday by Capt. Collins, who claims $25 wages for sailing her in the Put-in-Bay regatta.

There is talk of arrangements being made by the Northern Steamship Co. with the Pennsylvania Co. for a landing at the outer harbor next summer. While all this is very much in embryo, the Northern Steamship management openly avow their aversion to entering rivers, and say they would prefer lake front dock at any port, if it were sufficiently protected.

The Pennsylvania Co. will extend its old river bed dock facilities by improving 90 feet more of the frontage, which will afford additional storage capacity for nearly 100,000 tons of ore.

## CHICAGO.

*Special Correspondence to The Marine Record.*

The Union Line steamer Rochester, in tow of the tug Mosher, going up the South Branch of Chicago River last Thursday collided with the schooner Cape Horn, lying in the river near 16th street, and carried away the schooner's jib-boom.

The schooner Winnie Wing, in tow of the tug Protection, when going up the river Saturday morning collided with Madison street bridge and had her jibboom, cathead and jibstays carried away. The captain of the tug claims that the bridge was closed back upon the schooner after it had been partly swnng open.

The fine tug J. C. Perrett, Capt. Thos. Chron, has gone to South Chicago to await the arrival of the Lake Michigan Car Ferry Transportation Co.'s Car Ferry No. 1 recently built by James Davidson at Bay City. The Perrett has been purchased by the company to tow Car Ferry No. 1, also No. 2, which is nearly completed, between South Chicago and Peshtigo. The two car ferries will each carry 28 loaded cars and will be towed at the rate of 8 miles an hour by the Perrett. The water route from South Chicago to Peshtigo is 240 miles and the boats will make the round trip in five days.

The steamer Santa Maria, Capt. Eugene Rathbun, made her maiden visit to this port Saturday afternoon with 1,000,000 feet of lumber from Ashland. Her consorts the Teutonia and Thomas Gawn, also brought along 1,300,000 feet between them.

Nearly 4,000 tons of Black Horse coal has been unloaded at the O. S. Richardson Fueling Co.'s Market street dock during the past week from the steamer Alcona and consort Alta and the steamer Mary A. McGregor.

The Vessel Owners' Towing Co.'s tug Calumet towed one of the American Hydraulic Dredging Co.'s large dredges, 8-pipe scows and one coal scow from the drainage canal to Waukegan, where they will be employed to dredge out the harbor at Tacoma, Wash., at a cost of $6,000,000.

Capt. George W. Girdon, one of the most prominent navigators in the country, died at his home at Chicago, Friday, aged 81. He was for 20 years chairman of the local board of United States steam vessel inspectors.

Palmer, Cook & Calbick have chartered the W. H. Wolf for corn to Buffalo at 1½c.; the Fred Pabst for oats, South Chicago to Buffalo at 1⅜c. Carr & Blair chartered the W. H. Gratwick for corn to Buffalo at 1¾c. Capt. John Prindiville chartered the A. Weston, Eleanor and Jenette for corn to Port Huron at 1¼c.; the Canisteo for clipped oats to Buffalo at 1½c.; the Stewart for wheat to Cleveland at 2c.; the Pomeroy for wheat to Toledo at 1⅝c. P. H. Fleming & Co. chartered the Ogemaw and James Mowatt for 65,000 bushels of wheat to Toledo at 1¾c. Wiley M. Egan chartered the steamers City of Rome and Samoa and schooner Northwest for corn to Buffalo at 1¾c. J. G. Keith & Co. chartered the C. S. Parnell, Thomas Davidson and E. C. Pope for corn to Buffalo at 1¾c.; Marion, corn to Kingston at 3c.; Mary A. McGregor, clipped oats to Port Huron at 1¼c.

## BUFFALO.

*Special Correspondence to The Marine Record.*

Captain Simon O'Day has resigned as master of the S. F. Hodge and Capt. John Cassin, formerly of the Empire State, goes in her. It is understood that Feral Bros. have bought Capt. O'Day's interest in the Hodge.

The new steering gear on the tug Cascade was tried Monday and gave good satisfaction. It is of the Welch pattern, and is similar to the gear of the tugs Fabian and Babcock, except that the machinery is placed aft instead of in the pilot house.

The hatchet seems to be buried for all time by the Northern Steamship Co. and the excursion boats. It is now said that the excursion boat owners and managers have been invited for a trip on the Northern Line boats.

A lively legal fight over the Shrewsbury has just ended. In October, 1893, the Shrewsbury, owned by George Porter and others, which was plying between here and the Falls, was repaired by Walsh & O'Day, ship carpenters, and her machinery altered by R. W. Akin. Shortly afterwards she was sold to Toledo parties, ane has since been in the excursion business there. She got into debt and owing to some controversy over the terms of her purchase, she was put into the hands of a receiver, through an Ohio court. Proctor Josiah Cook then libeled her on behalf of Walsh & O'Day and Akin, the claims amounting to $1,000. The Shrewsbury was sold by order of the Ohio court, but immediately after her sale was seized on behalf of the Buffalo claimants, whose action has been sustained by the United States court. The money was paid over last Saturday.

The fleet of steel canal boats arrived here safely Wednesday, after a good but slow passage from Cleveland, the delay being chiefly due to caution in navigating. They began their canal trip Thursday evening. They attracted considerable attention while here, especially from the canal boatmen, who are less inclined to look upon them as competitors than as co-workers in the development of the canal trade.

J. J. Albright's seagoing yacht Sapphire has arrived at her home port for the first time. She was built for President A. L. Barber, of the Barber Asphalt Co., and has twice changed hands. She is 137 feet over all, by 19½ feet beam, and a draft of 9½ feet. She has a triple-expansion engine and a large Cramp boiler. She is schooner rigged. Mr. Albright expects to use her chiefly on the St. Lawrence River and the coast.

## DETROIT.

*Special Correspondence to The Marine Record.*

The small steamer J. H. Pauly has been sold to Capt. McLachlan, former master of the City of Detroit, and A. A. Gray, of Gray, Toynton & Fox.

By order of the underwriters, Parker & Millen are displaying the proper lights at night on the wreck of the Britannia.

Capt. William Goodyear, of the tug Witch of the West, has applied for a patent on a new invention, consisting of a winch situated on the after end of the tug near the tow-post. In operating it, the end of the tow-line is taken to the boat ahead and is attached to a reel, inside of which is a drum, into which steam is turned. The steam dries out the line, saving a vast amount of labor to the vessel, and lengthening the life of the line.

J. Phillips has sold the steamyacht Wanda for $3,200 to Oren Scotten.

Capt. N. S. Whipple has sold his one-half interest in the Raleigh and Tokio to Henry Wineman, Jr., "for $2 and other valuable considerations."

Baker Bros., of this city, have contracted to raise the steamer Nellie Torrent, sunk at Port Huron.

## MILWAUKEE.

*Special Correspondence to The Marine Record.*

For the week ending Saturday night 24 boats had arrived here with coal aggregating 40,587 tons.

The trouble with the coal handlers at Superior has had the effect of greatly increasing coal shipments to this port. Since the disturbance began over 60 boats which had been chartered for the head of the lakes discharged their cargoes here.

A sweeping change in the management of the Illinois Steel Co. effecting all of the 1,200 employes and including the resignation of Supt. C. S. Otjen and the discontinuance of the Milwaukee office will go into effect September 1. He will be succeeded by George L. Reis, of Cleveland.

The whaleback steamer Christopher Columbus washed out the Kipp dock last week. It is being repaired by Hathaway & Co.

## DULUTH AND SUPERIOR.

*Special Correspondence to The Marine Record.*

Congressmen Jenkins, of Superior, and Towne, of Duluth, are already laying their plans of campaign to secure a sufficient fund from the river and harbor bill for the improvement of the harbor at the head of Lake Superior, to an extent which will be made necessary by the establishment of the 20-foot channel through the Sault. The commission which reported to Congress last year recommended an appropriation of $3,000,000 as necessary to do this, and Major C. B. Sears, Engineer Corps U. S. A., is heartily in favor of carrying out the recommendation of the commission. The two Congressmen will try to have the above sum appropriated, to be expended at the rate of so much per year, on a continuing contract.

The Pennsylvania & Ohio Coal Co. is putting in a set of clam-shell scoops on its Duluth dock, similar to those employed on the Lehigh Valley dock in Superior.

Williams, Dougherty & Upham have completed the $25,000 contract for dredging the channel in St. Louis River from Grassy Point to New Duluth. The channel is now 17 feet deep and from 70 to 100 feet wide. In a month more the $35,000 contract for deepening St. Louis Bay will be completed, and the harbor appropriation for this year exhausted. The 21st avenue channel is being dredged and the north shore channel widened. Capt. Barker's $15,000 St. Louis Bay contract was completed about a month ago, and he will soon finish dredging the channel on the Superior side westward in Superior Bay.

The coal handlers' strike at Superior has been settled, the old men returning to work at the old scale of 40c. per hour or 17½c. per ton.

Concerning the newly incorporated Northern Coal Storage Co., a coal man interested says: "It is not a hydra-headed monster, as so many people imagine, and no undue advantage will be taken of the consumers. The nine head-of-the-lake coal companies lost $300,000 last year because they were in open competition and the trade was demoralized. The Northern Coal Storage Co. is the remedy for this state of things. All of the coal companies have for principal stockholders some of the big coal producing companies of the east. The companies here are supplied by the various individuals and firms whom they technically represent, and are charged a set figure. When competition was fierce it was easy for the companies here to get into the hole through quoting too close prices, bad debts, or an overestimate of stocks. Under the new system all the companies will buy their coal from the storage company and pay cash for the same. Then the companies will sell for cash only. Prices will be agreed upon, of course, but they will continue comparatively low."

Dock No. 1, of the Ohio Coal Co., has been cleaned up and repaired, and on Saturday received the first coal of the season.

During the first half of August Duluth shipped 138,000 tons of ore. It is estimated that Two Harbors shipped 165,000 tons, and the Duluth & Winnipeg docks 40,000.

## TOLEDO.

*Special Correspondence to The Marine Record.*

The yacht Comrade, schooner-rigged, had both masts carried away Sunday by collision with the tug Roy, whose bows the Iacht tried to crass. The Roy tried to get out of her way, but was towing a schooner, and the collision was unavoidable.

The U. S. Marshal sold the schooner Guest, owned by Mrs. George H. Rice, of Locust, to Thomas A. Wilkinson, Friday. Her new owner will convert her into a yacht.

Capt. Louis Goss launched his new sail yacht at Riverside park last Thursday evening.

Last Friday morning, while the schooner J. C. Fitzpatrick was coming up to the Columbus wharf, she caught one of the derricks on her jib-boom and lifted it bodily, depositing it in six feet of water in the river near the dock. Capt. George Daily is raising the derrick.

Mr. Charles Johnson, at one time engineer of the steamer Wellington R. Burt, died at Sandusky last week of blood poison. He was well known and highly respected here, and there were many flags displayed at half-mast in the harbor.

Four derricks have been placed in position to drive piles at the foot of Madison street, on the Traction Co.'s lot.

## LORAIN.

*Special Correspondence to The Marine Record.*

Otis E. Young and other stockholders of the O. Young Coal Co. have sold their interest to R. H. Wainwright, of Massillon, whither the offices will be removed. C. L. Penny has resigned the general management, although he still retains his interest, and will look after the business of the Penny Bros.' Coal Supply Co.

Lorain ore receipts for July were 42,404 tons, and of lumber 1,892,000 feet. Coal shipments were 57,696 tons.

Dredge No. 6 lifted the stern of the tug O. J. True out of the water Saturday, while her stern bearings were repaired.

A gust of wind caused the schooner Marion W. Page to take a sheer when towing out of the harbor behind the tug Cascade last Friday evening, and her jibboom demolished the light-house The loss will not be very heavy, as the structure was slight.

The new Brown hoists here sadly puzzled Capt. John Donahue, of the steamer R. P. Ranney, Sunday evening. He signaled for a tug and asked what port this was, thinking he had lost his bearings.

About 350 of the employes of the Johnson steel plant, with their friends, picnicked at Put-in-Bay Sunday, going up on the American Eagle.

Capt. Ralph Lyons, of the Zenith City, is a Lorain young man. His friends are all glad to see him prosper.

## ASHTABULA HARBOR.

*Special Correspondence to The Marine Record.*

The life-saving crew held services last Sunday evening in the boat-house. A number of guests were present.

The new King conveying machines on the P., Y. & A. dock, described August 1 in THE MARINE RECORD, are proving to be all that they are represented. Boats are receiving quick despatch, and as the operators are becoming accustomed to their work the machines are proving very successful in every respect in practice. Nine hundred tons of ore was taken out of the Keystone last Friday in 12 hours, with only two rigs.

Several car loads of material have arrived, to be used in repairing the Brown hoists which were blown down by the wind a few weeks ago, and the repair work be-

gan Monday. The damaged machines were raised to an upright position, and false work is being built around them. The broken and bent beams, braces and chords will be repaired and replaced. The wooden towers will be taken down and replaced with iron ones. It will require a month to do the work.

The big steel steamer Victory made her initial appearance here last Thursday and loaded 4,000 tons of coal for Duluth on a draft of 14 feet 2 inches.

Some complaints are coming in that vessels arriving at this port are encountering some obstructions in the outer harbor.

## NOTICE TO MARINERS.

BUOY ON MONUMENT SHOAL.

Notice is hereby given that a spar buoy, 25 feet long, painted black has been placed on Monument Shoal off Monument Point, East coast of Green Bay, Wisconsin. Depth of water at buoy, 18 feet. Marks the most westerly point of shoal.

By order of the Light-house Board,

COMMANDER J. H. DAYTON, U. S. N.
Inspector Ninth Light-House District,

DEATH'S DOOR PASSAGE—ENTRANCE TO GREEN BAY.

There is but 6 feet of water on the Nine Foot shoal. The black buoy on the Nine Foot shoal is 1400 feet, N NE. ¾ E (N 31° 45′ E.), from the position shown on Lake Survey Chart No. 35.

There is but 15 feet of water on the 18 foot spot, shown to the northward of the Nine Foot shoal; it is 2,200 feet northward of the black buoy mentioned above.

There are two wrecks on Middle shoal, the one to the northward of the red spar buoy having but 8 feet of water over it, the one to the SW. of the same buoy having 15 feet of water over it.

A least depth of 8 feet was found on Middle Shoal.

The black spar buoy marking the reef making off from the northern end of Plum Island, is 800 feet NE. from the position given on the chart, which would seem to indicate that the reef is making in that direction.

With strong southerly winds, vessels standing to the westward are advised to pass to the northward of Pilot island and, in all cases, to the southward of Plum island.

With any but strong southerly winds the passage to the southward of Pilot island is recomended.

BULLETIN OF RECENT CHANGES.

The following bulletin, issued by order of the Light-House Board, affects the List of Beacons and Buoys, Northern Lakes and Rivers, 1894 (Ninth, Tenth, and Eleventh districts):

PRESQU'ILE BAY, PENNSYLVANIA, Page 28.—Inner Lighted Buoy (North), No. 8.—On July 5 a gas-lighted buoy, painted red and showing a fixed white light, was substituted at the same moorings for the second-class nun buoy, in 16 feet of water, formerly on the N. bank at the inner edge of the dredged channel into the harbor.

LAKE HURON, MICHIGAN, Page 55.—Martin's Reef Buoy.—This buoy, a first-class can, black, carried away by a raft, was replaced in position on July 7 off the southeasterly end of the reef.

LAKE SUPERIOR, MICHIGAN, Page 70.—Big Bay Point Buoy.—This buoy, a 30-foot spar, black, was established July 25. Big Bay Point, S. ¼ E.; point of land W. of Big Bay, W. by N.

Point Abbaye Shoal (SE.) Buoy.—This buoy, a third-class can, black, was established July 25 in 20 feet of water. Huron Island Light-house, E. ¼ N.; Point Abbaye W. ⅞ N.

Point Abbaye Shoal (N.) Buoy.—This buoy, a third-class can, black, was established July 25 in 20 feet of water. Huron Island Light-House, E. ½ S.; Point Abbaye, WSW.

NOTES FOR NAVIGATORS.

Since the dredge worked in the harbor at St. Joseph, Mich., the channel has filled up an the north side so that there is r space only about 100 feet wide for the boats to pass through. Vessels should keep well to the south side of the river.

The lighthouse steamer Dahlia has placed a black spar buoy on the west side of the reef off Monument Point, near Sturgeon Bay, in 18 feet of water, This has always been a dangerous reef.

The limit of water at the Welland Canal is 13½ feet, and all vessels drawing more will have to lighten until the water rises. A red spar buoy has been placed about 350 feet S. by W. of the Ten-Foot Shoal buoy, near Encampment Crib, St. Mary's River, to mark a rocky shoal, with 13 feet of water over it.

Capt. J. D. Peterson, of the J. C. Lockwood, and Capt. F. A Bailey, of the Elphicke, report striking on an obstruction near the Point au Pelee dummy, with a draft of only 10 feet. They think it is a wreck, os there should be deep water all around there. Capt. Peterson locates it SE. by S. ½ S., 5½ miles from the lighthouse, and Capt Bailey, 4½ miles.

The government inspectors who are dredging the 20 foot channel at the lower end of Lake Huron, report a shoal about 300 yards to the east and 200 yards to the south of Corsica Shoals lightship, with only 15 feet of water over it. The inspectors advise masters of deep draft boats to keep on Lynn's ranges and check down, and there is no danger of their striking.

With the exception of two spots in the stretch from Ballard's reet to the Lime-Kiln cut, for 300 feet west of the Grosse Ile ranges, there is a channel of 17 feet. It must be noted. however, that this channel is west of the range where dredging has been going on. The two shoal points are now marked by buoys. On the port hand going up is a black buoy marking a bowlder that has only 16 feet over it at normal stage of water, and on the starboard hand, about 1,200 to 1,500 feet below Ballard's reef light, is a red stake marking a dangerous cluster of rocks, which cannot be removed as yet. This cluster has but 16 feet of water over it at the normal stage.

The U. S. S. Michigan reports a shoal about 1¼ miles long and about ¾ miles wide, with an average depth of 5 to 6 fathoms of water over it, and one spot, a rock, with only 20 feet of water over it. The spot lies 7¾ miles, W. ⅝ S. (S. 82° 23′ W.) from Beaver Island light.

The dome of the Masonic Temple, Chicago, is now brilliantly illuminated with incandescent lights from 7 p. m. until midnight, daily, Sundays and holidays included, regardless of the weather. The lights are placed in a horizontal line around the dome, and 318 feet above the level of the lake. They alternate in groups of three red and five white.

A black second-class can buoy has been established off South Point, Milwaukee, in 20 feet of water, on the following bearings; Milwaukee pierhead light, N. W. ⅛ N. (N. 43° 43′ W.), Milwaukee light-house, N. by W. ¼ W. (N. 14° 18′ W.); Dome of St. Francis College, W. ¾ S. (S81° 33′ W.) The water between this buoy and South Point is foul, containing rocks with but 12 feet over them. There are two small shoals, with 17 and 18 feet of water over them, lying respectively S. by E. ¼ E. (S. 14° 03′ E.), distant ¾ miles; and S. by E. ⅞ E. (S. 21° 05′ E.), distant 1 mile from the buoy.

The fixed white light on the Kate Kelly wreck, which lies in 54 feet of water off Racine Point, is on the following bearings: Racine (Root River) light SW. ¼ S. (S. 42° 11′ W.), distant 4 miles. Wind point (Racine point) light W. ¾ N. (N. 81° 34′ W.), distant 1⅝ miles. This wreck is a dangerous obstruction to vessels, as one of the masts projects about 20 feet out of water.

An examination was made by the Hydrographic Office of Spectacle Reef on July 15, and it was found that the shoal water (less than 18 feet) extends about 1,000 feet eastward and about 2,500 feet southward from the light-house.

The obstruction near Port Colborne on which the Omaha struck has been removed, leaving a depth at that spot of 16 feet. Near by, however, there is one rocky spot with but 15½ feet over it, and a sandy spot with but 14 feet 9 inches; 16 feet may be carried to within 100 feet of the south end of the east unbroken pier, but inside scant 15 feet will be found. There is a sand pit making out southwesterly from the south end of this pier (continuous part), and 100 feet distant there is but 13 feet at the edge of the track. The deepest water track is very narrow, and a vessel only her own width out of it will find, in all probability, a foot less water. In giving these figures it is assumed that there is 14 feet on the dock sill, with a liability of a change of one foot either way.

## TESTING THE NORTH WEST'S BOILERS.

Chief Engineer Perry and Passed Assistant Engineer Norton, of the U. S. Navy, are making a round trip on tke steamer North West to learn from personal observation a few facts regarding the qualities of the Belleville type of tubulous boiler, with reference to its possible use in battle ships now about to be built. The tests are not "tests" at all, but merely observations of the practical workings of the boilers, and the report, which is private, will be submitted to Chief-of-Engineers Melville.

WORK has been started at Roach's shipyard, Chester, on two steel steam-yachts, each to be 150 feet long.

## NO REASON FOR DISPUTE.

*To the Editor of The Marine Record:*

Will you please answer a disputed question through THE MARINE RECORD? Can a steamboat make as good time with a strong head wind as with the wind after her? I claim he cannot. W. A. M.

With an equal amount of power exerted a steamer certainly cannot make the same time against that she can before the wind, the resistance being proportionately increased, in one instance, while the force of the wind is applied in the same direction as the propelling power of the boat, in the other instance and assists, unless the boat's speed is faster than that of the wind. The effect is much the same as the current of the water. Your disputant has evidently been deceived by a steamer using less power in going before the wind than in returning against it, the increased steam enabling her to make the same time in both directions.

The effect of the wind is so marked that owners have for years been opposed to the erection of many houses on deck, and the slight resistance of wind has always been one of the greatest points in favor of the whaleback and monitor models. Not only the force of opposing winds, but that of the air cuts a material figure. This is so thoroughly appreciated that two passenger steamships which have been accused of racing on Lake Michigan, have, before starting out, taken the precaution to remove the canvas from the rail of the bridge, and to take such other measures, apparently trivial to the landlubber, to avoid resistance to the greatest possible extent.

## FLOTSAM AND JETSAM.

The Canadian coast survey boat Bayfield is still at work near Port Dover.

Manitowoc is receiving large quantities of coal to fue the Goodrich passenger steamers.

The tug Agnes C. was sold at Green Bay under mortgage foreclosure and bid in by Henry Hahar for $1,100.

The old government lighthouse at Bete de Gris, entrance to Lac la Belle harbor, Lake Superior, which has been unused for some time, has fallen down.

The schooner Mystic Star was towed into Ludington a few days ago after being 18 days out from Cleveland. It is said that the crew were without provisions for three days.

Vessel men have been urging upon Gen. Supt. S. I. Kimball, of the life-saving service, the importance of establishing a station near Fort Gratiot, at the foot of Lake Huron.

Thirty men of the day force of Scott & Co.'s ore docks at Erie, Pa., were discharged for refusing to work an extra hour last Wednesday night without being paid 18 cents over the regular tonnage rate.

Marine men, or at least some of them, seem to be of the opinion that the government officials are making a mistake in locating the new life-saving station on Plum Island. It should either go to Pilot Island or to the mainland.—Sturgeon Bay Advocate.

The three-masted schooner Nellie Lamper has recently changed hands, the consideration being $5,750. She was owned by the Lamper estate, was built at Mystic, Conn. in 1875, and is enrolled as hailing from Chicago, although she has always been engaged in the Atlantic coasting trade.

Lieut. W. W. Harts, of Newport, R. I., Engineer Corps, U. S. A,, advertises in another column for sealed proposals for the purchase from the United States of a tug, dredge, water-boat, three dump scows and a sand-pump, complete with boiler. Bids will be opened September 19.

Six students of the Webb academy for shipbuilders at Fordham Heights, who recently built a yacht after a Herreshoff model, have started in her for a lake cruise, being bound for Detroit. The boat was launched in Harlem River about ten days ago. She is fully rigged and amply provisioned. They are coming via the Erie canal.

THE navy propose to experiment with a device for distributing oil at sea, invented by a seaman, Thomas W. Wilson. The device consists of a metal oil-tank, inclosed in a wooden box, provided with a door in the side to show the gauge, which indicates the quantity of oil in the tank. A rubber tube passes from the bottom of the oil-tank through the top to the surface of the sea. This tube is fitted with a bulb for siphoning the tank, with a stopcock for regulating the flow.

## "SQUATTING" OF SCREW VESSELS.

BY I. McKIM CHASE.

Various explanations have been offered as to the cause of the phenomenal increase in resistance to vessels when traversing shallow water, and also as to the settling of the stern when propelled at a high rate of speed, but none, so far, have met with general acceptance. Some writers look upon the latter as the result of the water not filling in with sufficient quickness the cavity at the stern which is caused by the forward movement of the vessel. This explanation is probably but partly correct, as similar phenomena are less noticeable with paddle-wheel steamers. With very fast screw vessels this settling of the stern, or squatting, as it is called, is very conspicuous. Any vessel driven by screw propellers meets with an increase of pressure at the bow, the result of the displacement of the water there, and which has a tendency to lift the forward part of the vessel; while at the stern the pressure is diminished by the action of the propellers, or propeller. The action of screw propellers causes a reduction of pressure on the hull immediately before them, creating a tendency in the water there to flow towards the screws. Some call this a suction action. Aft of the screw propellers the pressure on the hull is diminished in consequence of the velocity with which they discharge the water, this being in some cases, considerable; and the greater this velocity the greater the reduction of the pressure. This is in accordance with a principle of hydraulics wherein, under a given head, the lateral pressure of a flowing stream becomes less as the velocity of flow becomes greater. The increase in resistance to a vessel that results from the action of the screws has been termed by Dr. Froude "resistance augmentation."

The water when discharged by the screw naturally follows the path of least resistance that is immediately in contact with the after part of the vessel when the screws are situated beneath, as twin screws are. The discharged water flows towards the surface and is there met by the water flowing in to fill the cavity caused by the advance of the vessel, rises above it, forms a crest and gives to it the appearance of a wave following the vessel (see fig. 3). In some cases this, as before said, is excessive, and in shallow water it is believed to increase. Instances are recorded (in the case of fast torpedo boats) where the discharged water from the screws actually rolled over and broke upon the deck of the vessel. Fig. 2 illustrates the vessel at rest.

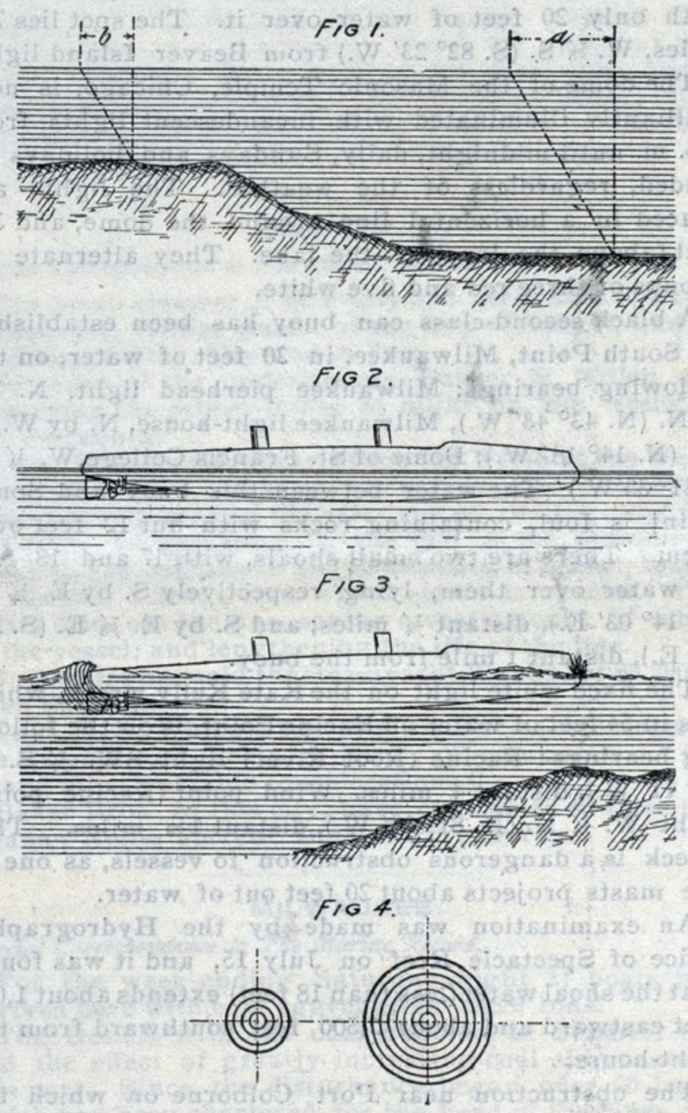
As to the increase in resistance experienced by an advancing vessel when meeting with shallow places in its course, analogy is found in the retardation in velocity of the current of a flowing river caused by its bottom. The flow of a river is in obedience to the laws of gravitation. The velocity of its current throughout is not uniform; the lowest part in contact with the bottom has its velocity retarded by reason of the friction that results from the particles of water rubbing over the bottom.

A perfect fluid is considered to be frictionless with regard to the movement of its particles among themselves, but water is not a perfect fluid; consequently friction ensues when it moves over another substance, and a retardation of motion is the result. The small amount of viscosity possessed by water assists in communicating this retarding effect among its particles.

The water of a river may be considered as divided into layers (fig. 1). The layer in contact with the bottom has its velocity reduced by the rubbing action while flowing over the bottom. The next layer immediately above is retarded in consequence of the friction between its particles and those of the lowest layer; this in turn similarly effects a retardation of the next layer above, and so on. Each succeeding layer from the bottom to the surface is similarly retarded, but with gradually diminishing intensity, the greatest velocity being at the surface in mid-stream. When the stream varies in depth the velocity of the current is most retarded in the shallowest places in consequence of the smaller distance throuh which the retarding effect of the bottom acts. Assuming that the quality of the bottom is uniform, and that the current along it is retarded the same at the shallow and deep places, and that this retardation uniformly diminishes towards the surface of the stream, then the velocity of flow at the surface over the deep and shallow places, will be represented, respectively, by the distances *a* and *b*.

An object, as a vessel, moving along the surface of water, especially still water, in consequence of the friction resulting from the movement of the particles of water over the surface of the vessel, imparts motion to a body of water extending some distance from the vessel, and this water is carried along with the vessel. From a similar cause to that of the bottom of a river affecting the current upwards, the water will affect for some depth the water downwards. The layer of water in contact with the surface of the vessel is caused to advance with it in consequence of the resulting friction, and this in turn causes the next layer to move with it, and this again produces motion in the succeeding layer, and thus, with diminishing effect, the water is given motion for some distance from the vessel in the direction from which it moves. What this distance is has not yet been determined, but it will probably vary with the form of vessel, its velocity and the nature of its surface. From the retardation that is observed when vessels running at high speed pass over shoal places, it is believed to extend to depths exceeding three or four times the draught of the vessel. The greater the speed of the vessel the greater will be the body of water carried along with it, for the reason that more motion is absorbed by the water from the vessel.

Fig. 3 illustrates a vessel advancing and carrying




along with it a body of water. From this it may be conceived how it is possible for a vessel to experience increased resistance when passing shallow places where this body of water would be dragged over the bottom and the resistance from this cause be transmitted through the several layers to the vessel. This carrying along with it of a portion of the material through which a body passes appears to prevail generally. It is well known that a bullet passing through air carries along with it a large body of air. In the published accounts of experiments in France on the penetrative effects of the Lebel rifle on ordinary snow, the experimenters were surprised to discover that a penetration of the projectile of more than five feet could not be obtained, even though fired at the same distance at which it had been made to pass through a tree 3-12 feet in diameter. The reason given for so small a penetration is that the projectile entering the snow with a high velocity and a rotary motion due to the rifling, collects particles about it and drives them ahead until the accumulated mass arrests its course; or, in other words, it carries along with it a body of the snow, and has not only its own resistance to overcome, but also that of the mass of snow which it forces along. This phenomenon is noticeable even in such an exceptional case as that of a projectile penetrating in armor plate.

It may be urged that it is not possible for resistance to be transmitted through water in this manner. In answer to this, the increase to resistance to the flow of fluids in small pipes may be referred to. The smaller the diameter of the pipe the less will be the proportionate discharge.

Let A and B (in fig. 4) represent the cross sections of pipes. Assume the former to be double the diameter of the latter, or, the former one inch and the latter one-half-inch in diameter. Suppose them to be divided concentrically into equal divisions representing layers of water one-sixteenth of an inch thick. Assuming the quality of surface to be the same, the coefficient of friction will then be equal in each case. The flow being under equal heads, the outer layer in each case will be similarly affected and equally retarded, the flow through the pipe meeting with its greatest resistance there. The retardation of the outer layer will affect the layer next to it in consequence of the mutual friction of the particles, and this in turn will retard the next layer, and so on, with diminishing effect, each layer towards the center of the pipe. The larger pipe, having a larger number of layers will be less affected in the center of the pipe than the smaller one, which has fewer layers. In other words, the outer layer of the half-inch pipe meets with greater resistance than the corresponding layer from the center of the large pipe; consequently the area of one-half inch in diameter in the center of the large pipe will permit a greater flow than the area of the small pipe.

## NEW PATENTS.

Following is a list of new patents which have been recently awarded on inventions bearing on navigation, marine trade and relative matters:

No. 544,479.—Means for Operating Swinging Beams of Excavating Machines. Wm. Davy, Kenosha, Wis., and Ernest J. Davy, Chicago. Filed June 22, 1895, serial No. 553,715 (no model).

544,460.—Dredging Apparatus (suction). Caleb G. Collins, Woodbury, Alburtus C. Hilsinger, Killawog, and Calvin A. Stevens, New York, N. Y.; said Collins and Hilsinger assignors to said Stevens. Filed Mar. 4, 1895, serial number 540,565 (no model).

No. 544,676. Folding Boat, Manfierd U. Loree, Miamisburg, assignor of two-thirds to Eugene A. Othmer and Wm. D. Huston, Dayton, O. Filed March 12, 1895. Serial No. 541,509. (No model).

No. 544,667. Automatic Hatchway Door Operating Device, James M. Elder, Indianapolis. Filed June 19, 1894. Serial No. 515,064. (No model).

No. 544,733. Bridge. Robert P. Lamont, Chicago. Filed Jan. 5, 1895. Serial No. 533,901. (No model).

No. 544,755. Water Elevator and Motor, Josiah E. Symons, Boise City, Idaho. Filed Feb. 1, 1895. Serial No. 537,015. (No model.)

No. 544,792. Upright Marine Boiler, William N. Oldman. Buffalo. Filed March 23, 1885. Serial No. 542,889. (No model).

No. 544,979. Ship's Berth, William P. Hoskins, Birmingham, Eng. Filed Dec. 6, 1892. Serial No. 454,296. (No model). Patented in England.

Nos. 544,980, 544,981, 544,982, same, to same.

544,608.—Life-boat. George Bluemcke, Brooklyn, N.Y., filed Mar. 28, 1895, serial number 543,552 (no model). The claim is for a keel of practically rigid material, a stem and a sternpost of practically rigid material secured to the keel; a supplementary stem and sternpost of elastic material firmly secured to the keel; a series of elastic ribs secured to the keel between the stem and the sternpost; a series of longitudinal elastic side-bars provided with eyes to engage the ribs, and connected at their ends with the supplementary stem and sternpost; two upright standards firmly secured to the keel; a seat guided by said standards and constructed to move up and down on the same; and braces hinged at their inner ends to the seat, and at their outer ends to the elastic ribs. Also the combination with the keel, the stem, and the sternpost, of a supplementary stem provided with guides which engage the stem, and of a supplementary sternpost provided with guides which engage the sternpost.

A full description of these patents can be obtained by sending to the Patent Office, Washington, 14 cents for each, and mentioning THE MARINE RECORD.

THE new steamship Howard, built at the yard of Harland & Hollingworth, Wilmington, Del., and a cut of whose hull and engines appeared in the MARINE RECORD a few weeks since, has gone into commission.

## SUGGESTIONS TO CONGRESS.

It is to be hoped that the next Congressional Committee on Merchant Marine and Fisheries will be made up of men in a large degree acquainted with the real wants of shipping and who will devote time and attention to becoming acquainted with the condition and outlook for this trade, regardless of political connections, says the New York Maritime Register. This is a large request, continues this journal, but it is the only one that should obtain in seeking a solution of what is now the shipping problem. To treat it in any other way is to make it again the shuttlecock for political battledores. The shipping industry is one that vitally concerns the whole country, and its prospects and wants must be managed upon the most liberal and most broad minded plans. It is in no way, whatever, sectional; and in no sense, whatever, political. It has to do entirely with the future commercial welfare of the nation, and is the chief means by which the commercial supremacy of the world will be won by this country. It has been hampered, neglected, and abused for many years, and yet shows such signs of great vitality that it would not be so immensely difficult to put it on the high road of prosperity again. The time is now at hand when it should be encouraged and helped forward. And a start in this direction must come from Washington. It is unfortunate at this time that shipping has no real representative in the National Legislature, but it is to be hoped that in so far as may be possible, care will be taken to select only the best men to make up the committees that have to do with shipping in Congress The opportunity to show good statemanship in dealing with shipping legislation will soon be here.

There are many laws yet on the statute book that if enforced would seriously hamper our shippIng. They were passed years ago for special purposes which do not now exist. They had reference to conditions no longer possible and to a navigation system and type of vessels entirely superceded. But they remain and seem to rise up for enforcement, like Banquo's ghost, at most unseemly times, to the confusion of both shipowner and government officer. It would be wise to rake up all these fossils to the end that Congress should destroy them. While they exist they are nuisances. The navigation laws should be thoroughly codified and the useless ones, of which there are many, weeded out. This simplification would leave the field clear for much legislation that is really needed to help and protect our shipping.

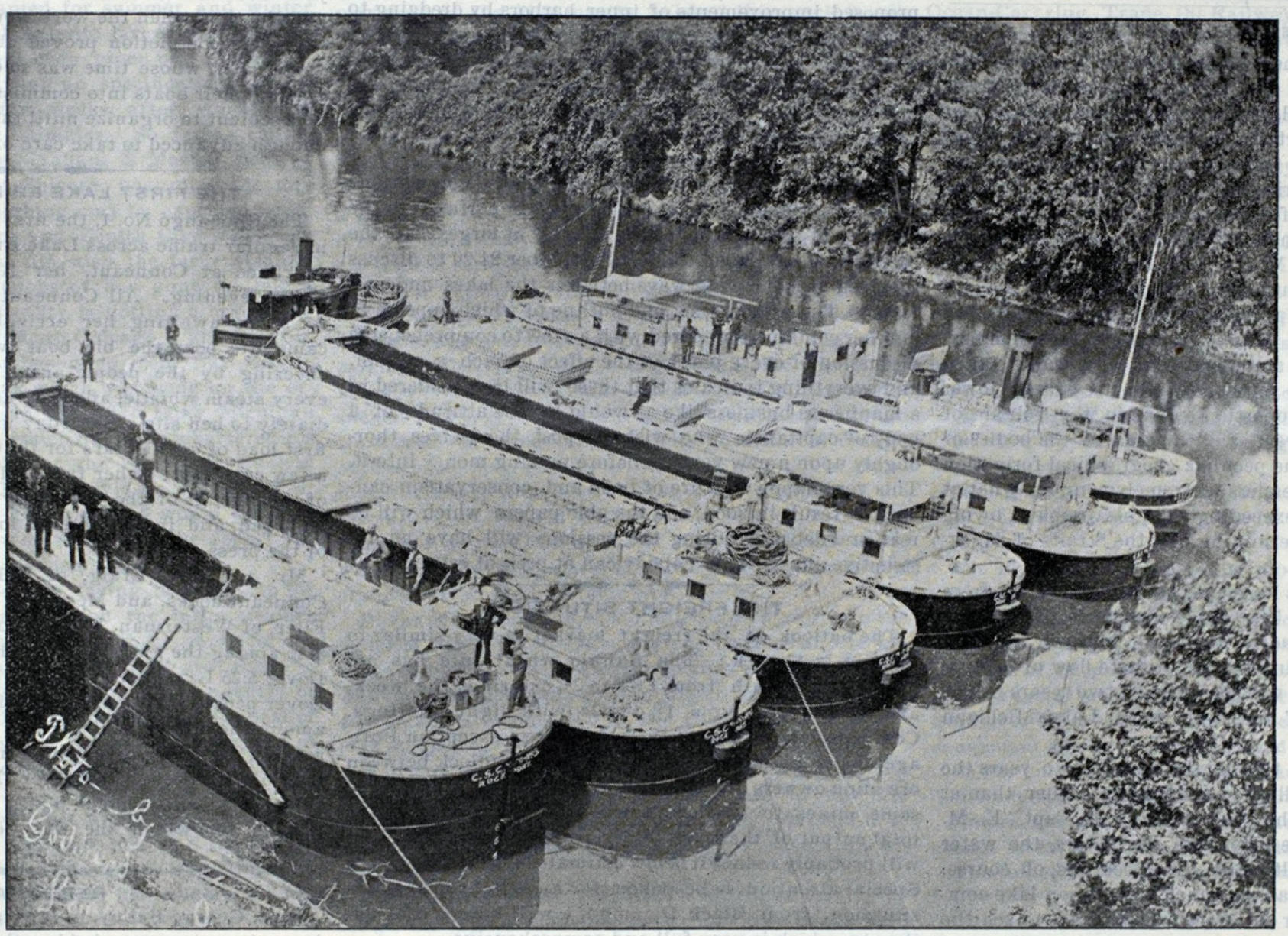
## COL. ABBOTT'S SUCCESSORS.

The retirement of Col. Henry L. Abbott on Monday caused a reassignment of duties of a number of officers of the Engineer Corps, but involved no changes of stations. Col. Henry M. Roberts succeeds the retiring officer as president of the board of Army Engineers, and will also be president of the Board of Harbor Lines at New York. The important billet of member of the Board of Ordnance and Fortification left vacant by Col. Abbott's retirement was filled by the assignment of Col. C. P. Haines, the successor to Gen. Craighill, in charge of the Maryland District. Col. John M. Wilson will, in addition to his present duties in charge of public buildings and grounds in Washington, take Col. Abbott's place as Division Engineer of the Northeast Division. He will make his headquarters in Washington. The jurisdiction extended as far west as Detroit River during the term of Major Overman's service, but on the succession of Lieut.-Col. Jarad A. Smith, Col. Abbott's supervision ceased, by virtue of the army regulations affecting junior and senior officers.

## THE STEEL CANAL FLEET.

(ILLUSTRATED)

The accompanying view of Black River, above Lorain, taken when the six boats of the Steel Canal-boat Co. were loading steel rails for delivery at New York, gives a very good idea of the construction and possibilities of these boats. The large fore-and-aft hatchways, open and closed, are especially prominent, as well as their sectional covers. The steamer Alpha is the farthest distant in the picture, and the escorting tug Joe Harris is in attendance. At the forward end of the deck over the engine room on the steamer will be noticed a short stack, which is substituted for the high one when the



THE STEEL CANAL BARGES.

boats are bound through the canal. The dimensions of the boats are 98 feet over all, by 17 feet 11 inches beam, and 10 feet depth. They have hardly arrived at New York with their first cargo, which consists of 2,740 steel street railway rails.

## MORE SAILING DIRECTIONS.

Part III of the sailing directions for the Great Northern Lakes and Rivers, which are being issued by the Hydrographic Office, is a book of considerably greater thickness than the six previous volumes, although it covers only the North Channel of Lake Huron and Georgian Bay. The book contains 290 pages of carefully compiled matter, in addition to which is a complete index to all the matter contained therein, so that any locality and the peculiarities and quirks of its navigation may be referred to at a moment's notice. The information was compiled principally from the Georgian Bay and North Channel Pilot, issued by the Dominion Department of Marine and Fisheries, but much additional information has been secured through the courtesy of local authorities. This book, together with all previous publications of the Hydrographic office, are always on sale at the office of THE MARINE RECORD, at the fixed government prices. The Third Volume of the sailing directions sells for $1.

## A NAVAL EXPERIMENTAL TANK.

The navy is to have an experimental tank in which many important questions of naval construction can be practically tested before vessels are laid down. This is a subject that has engaged the attention of experts for a number of years. In Europe nearly every country has an experimental tank in which models of new ships, whether built for war or commerce are subjected to preliminary trials before the work of construction is begun. England, France, Germany, Italy and Russia tests models of their vessels in such tanks before beginning actual construction. Experiments of this kind have been found valuable and a source of great economy. The Bureau of construction has long desired an experimental tank, and Chief Constructor Hichborn, following the recommendations of Mr. Wilson, his predecessor, has repeatedly urged that Congress be requested to provide the necessary funds. It has been estimated that $60,000 would cover the expense of construction. Congress has failed to make the appropriation. As a result this country, singularly alone, has had to depend upon theoretical calculations in the important matter of determining upon designs of ships to be constructed. Now, however, a partial step in the right direction is to be taken. Chief Constructor Hichborn has decided to the fullest extent possible, considering the requirements and the funds available, an experimental tank is to be built. To this end Assistant Naval Constructor Ferguson has been assigned to the duty of preparing a tank at the Washington Navy Yard. It will be the slip between an old ship house and the Potomac. The dimensions will be about 70 feet long, 30 feet wide and 12 feet deep. In the tank will first be tested a model of battle ships Nos. 5 and 6, the designs of which are now being prepared. The model has been built and is a miniature of the actual vessels. Relatively it has the approved length, breadth and draft, and in a general way it represents the new ships as they will be when ready for service. It will be supplied with electrical motive power and when the tank is ready experiments with it, to determine certain important data, will take place. The principal point to be settled in the tests relates to the resistance of ships to waves as the result of friction on the bottom. From the tests it is expected that absolutely definite conclusions can be reached as to the performance of real ships. Questions of speed, stability, turning, and other performances of value to naval architects, will be determined.—Army and Navy Register.

DURING July Scotch shipbuilders launched 21 vessels, of 19,137 tons, as compared with 29 vessels, of 45,525 tons in June, and 22 vessels, of 12,022 tons in July, 1894. Up to August 1, they have launched a total tonnage this year of 210,967 as compared with 195,510 for the corresponding period in 1894; 164,863 in 1893, and 247,638 tons in 1892.

ENGLISH builders launched 14 steamers during July, against 16 in June. There were five vessels, of 12,020 tons, launched from the Wear, the total for the year so far being 33 vessels, of 76,698 tons, against 44 vessels, of 96,520 tons, for the corresponding period last year.

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## DRAINAGE AND LAKE LEVELS.

The members of the Board of Army Engineers, detailed to inquire into and report upon the effect of the Chicago drainage canal, have completed the first part of their work—the ascertaining of the amount of water likely to be discharged through the canal in a given time—and the task of securing data at the heads of St. Clair and Niagara Rivers, for purposes of comparison, will probably follow at once. While the members of the commission—Gen. O. M. Poe, of Detroit, Major E. H. Ruffner, of Buffalo, and Capt. William L. Marshall, of Chicago—cannot with propriety make known the nature of their report to the War Department, the members agree in the general statement that any water taken from the lakes by this method would necessarily lower the levels, in the proportion equal to the volume of water drawn off, as spread over the area of the bodies of water drained. But the peculiar geographical formation of the chain of lakes renders extremely complex what at first appears to be an exceedingly simple problem, owing to the difficulty of determining how the Straits of Mackinaw will be affected.

The canal is 28 miles long, and the outlet at first from Lake Michigan will be 5,000 cubic feet of water per second. This will be steadily increased, however, until, in the opinion of the engineers, the ultimate flow of 100,000 cubic feet per second will be reached two years hence, when the full effect of the drain upon Lake Michigan will be demonstrated.

It is very probable that by the end of two years the level of the lakes will be considerably higher than at present. In 1847, within the memory of Capt. E. M. Peck and others of the older lake navigators, the water was lower than now, although the effect was, of course, not so apparent, and had not much effect upon lake commerce, as the number of craft whose draft taxed the depth of water at the shoal spots was much smaller. At the same time its effect was sufficiently marked to cause that season to be well remembered, and is in itself an additional proof of the theory that the lake levels are governed solely by the amount of precipitation on the lakes and in their immediate vicinity.

The amount of territory drained by lakes Superior and Michigan is very limited, in comparison with the area of these vast bodies of water themselves. To the north of Lake Superior, the summit of the watershed is scarcely fifty miles distant, and to the westward it is not a great deal farther away, the water then flowing off towards the Mississippi and the several large rivers tributary to Hudson Bay. The Mississippi drains also a part of Wisconsin and nearly all of Illinois, and while the precipitation of the Lower Peninsula of Michigan goes to feed Lakes Michigan and Huron, a few miles east of Georgian Bay will be found conditions similar to those on the Canadian side of Lake Superior.

Of course the area of the lakes themselves is so great that an inch or so of rainfall over each body would add directly to the depth of water; but such heavy general rains have been rather a rarity for ten years past, and the precipitation since 1886 shows a total shortage of twenty-seven inches of rainfall, as compared with the average for a number of years prior. This is equal to the full depth of two feet three inches on the actual area of the lakes, on which such a rainfall might have occurred, and in addition to the contributions of streams flowing into the lakes, after deducting the comparatively small amount drained and pumped from the lakes and not returned.

There has been some muttering among lake men whose memory does not extend back to 1847, with reference to the continued dredging for deeper channels, and the complaint is made more frequently than one would imagine possible, that "digging out the bottom only tends to lower the surface of the water." If the theory were worth the trouble of obtaining data regarding the number of yards dredged out and of figuring out its microscopic proportion to the great body of water from which its displacement is subtracted, the absurdity would at once be apparent; but nearly all material dredged out is immediately returned to the water at some deep locality, and this deduction amounts to nothing.

The considerations of all questions regarding lake levels, however, can only prove beneficial, as bringing about a popular understanding of all the conditions which effect this phase of the navigation of the Great Lakes. It is especially valuable in connection with the proposed improvements of inner harbors by dredging to 20-foot depths, rivers which are, in effect, sewers, and which are made more and more sluggish by such deepening until they become mere creeks full of reeking filth, save for the few days when heavy rainfalls and freshets again given them substantial currents.

CLEVELAND has been the scene of many conventions of late, but none will prove of as vital importance to the interests of this section, or the country at large, than the body which has called to meet September 24-26 to discuss the need of deep waterways between the lakes and salt water. The programme, and outline of which appears in another column is prepared with a view to comprehensive discussion of every phase of the effect of such a system, and everything indicates that these will be considered in a manner as business-like as would be the attitude of a body of capitalists who wish to post themselves thoroughly upon a new venture before putting money into it. This very happy mixture of push and conservatism cannot but result in good, and the able papers which will be read and debated during the sessions will have an instructive effect which nobody can at present estimate.

## THE FREIGHT SITUATION.

The outlook in the freight market is very similar to that of last week. The Buffalo wheat rate has advanced, at Duluth from 2½c to 2¾c during the week, and at Chicago from 1⅝c to 2c with light offerings. Coal rates are strong at the old figures, except on Portage, which has advanced to 40c. The deadlock between ore mine owners and the men, which has already caused some mines to be flooded will materially reduce the total output of the Lake Superior district this year, and will probably reduce it below estimates heretofore given. Special attention is bespoken for an article on the coal situation, from Black Diamond, a well-known coal authority, which is very full and comprehensive.

The Secretary of the Chicago Board of Trade gives the following as the visible supply of grain on the dates named:

| | Aug. 19, 1895. | Aug. 20, 1894. |
|---|---|---|
| Wheat, bushels | 36,892,000 | 63 901,000 |
| Corn, bushels | 4,293,000 | 5,390,000 |
| Oats, bu hels | 3,785,000 | 2,370 000 |
| Rye, bushels | 304,000 | 331,000 |
| Barley, bushels | 31,000 | 422,000 |

The following statement shows the stock of grain in store in public elevators at Duluth for the week ended Saturday, August 17:—

| | Bushels. |
|---|---|
| No. 1 Hard wheat | 3,979,862 |
| No. 1 Northern wheat | 1,061 837 |
| No 2 Nor hern wheat | 292 018 |
| No. 3 spring wheat | 72 113 |
| No grade spring wheat | None |
| Rejected and Condemned wheat | 39,241 |
| Special bin wheat | 147,437 |
| Aggregate | 4,992 505 |
| Wheat in store at Minneapolis | 5,413,193 |

## THE ST. LOUIS' RECORD.

The American liner St. Louis attained an average speed of 22.3 knots per hour for four hours a few days ago, and wins a remunerative mail-carrying contract. She at one time got her speed up to 23.6 knots. Owing to possible errors in the calculations, the naval officials making the test, which occurred in the English Channel, think the steamer's average speed will prove to be at least 22.5 knots.

## CLEVELAND'S MARINE BOARD.

The directors of the Cleveland Chamber of Commerce has instructed Secretary Ritchie to call a meeting of all members of the Chamber whose business interests are connected, directly or indirectly, with the commerce of the Great Lakes, with a view to effecting the prompt organization of a Marine Board, as one of the constituent bodies of the Chamber. This meeting will be held early in September, and the board will be formed much on the plan recommended by the Committee on Navigation, which was filed early last spring, and a synopsis of which appeared in the MARINE RECORD at that time. While the organization will be, strictly speaking, a Cleveland business body, yet the scope of the work mapped out is such that its effects will be felt on the kntire chain of lakes. It is the intention to delegate the work os preparing for the Deep Waterways Convention to this body, and while the task would be too heavy for such an infant were it acting independently, yet the Chamber of Commerce will be behind it in all it will do. Local harbor improvement and several other matters important to the commercial interests of Cleveland will be taken up at once.

The report of the Committee on Navigation was filed just before the close of the Chamber year, in the spring, and the time when the work would otherwise have been carried to completion proved the busy period for the vossel men, whose time was so entirely taken up with getting their boats into commission that it was deemed inexpedient to organize until the season should be far enough advanced to take care of itself.

## THE FIRST LAKE ERIE CAR FERRY.

The Shenango No. 1, the first car ferry boat to engage in regular traffic across Lake Erie, made her initial appearance at Conneaut, her American terminal, last Friday evening. All Conneaut had been on the docks for hours awaiting her arrival, and when she finally came into port, the big boat was greeted with hearty cheering by the people and a deafening salute from every steam whistle, afloat or ashore. She went immediately to her slip. Saturday morning she took on her first load of coal in cars for the Grand Trunk, departing a few cars short of her full load, but carrying a number of the officials of the Pittsburg, Shenango & Lake Erie Railroad, and invited guests, including representatives of the press.

Mr. and Mrs. Craig, of Toledo, Supt. Day, of the Conneaut docks, and Messrs. S. C. Andrews and Enoch Filer, of Westerman, Filer & Co., coal operators, were also among the guests. The Shenango arrived at Port Dover 5:25 Laturday evening. A large crowd of Port Dover people gathered at the wharves to greet the boat, among them Hon. D. Tinsdale, M. P., and Mr. Ansley, reeve of the port. A very neat tribute to the new line was that of the reeve's daughter, Miss Tina Ansley, who stood in a conspicuous place, waving the Stars and Stripes, for which she was heartily cheered from the boat.

## PERSONAL.

Capt. George Bailey, of Oswego, died last week. His funeral services were held on Sunday, and were largely attended, services being conducted by one of the local clergymen and the Masonic fraternity. The pall-bearers were Captains Stephen Lafavier, William McCarthy, George Atkinson, Andrew Robinson, James Papa, and John Molther.

Capt. J. A. Holmes has retired from the command of the steamer Alva and Capt. John W. Wysoon has been appointed in his place. Capt. Holmes has been offered the command of the Gladstone, from which Capt. Wysoon was promoted.

Capt. Tyler Morley. J. A. McKenzie, L. M. Morley and friends, of Marine City, have been enjoying a Lake Ontario cruise on the yacht Ethel.

Mr. George A. Matteson, who has been with S. F. Hodge & Co. for twelve years, has accepted a position with the Detroit Dry-dock Co., in their engine works, thus giving Mr. C. B. Calder, the superintending engineer, more time to devote to outside work. The change takes place September 1, when Mr. Matteson will be succeeded at the Hodge Works by Mr. Henry Penton, who recently resigned his place at the Frontier Iron Works for this purpose. William L. E. Mahom, who has been with the American Steel Barge Co. for several years, now returns to his former position with the Frontier Iron Works.

# SHIP BUILDING AND REPAIRS.

## THE WEEK IN SHIP-BUILDING CIRCLES.

The past seven days have been very quiet, so far as the placing of orders for new tonnage is concerned. A good deal of contemplated construction has, however, been brought to light, and the prospects are that the vacant berths in the lake shipyards will be filled before long. While the rapid advance in structural material led to an advance in prices on new floating property of nearly 25 per cent, checked the placing of orders for a little time, yet this could have no permanent effect against the general tide of commercial revival and prosperity.

The directors of the American Steel Barge Co., which is doing nothing at present in the way of steel construction, has resulted in the information being semi-officially given out that there will be more new steel oil barges built for the Standard Oil Co., the trials of those built last winter and spring having proven satisfactory in every respect, save that it is considered that the next boats of this type should be larger.

The Goodrich Co. have avowed their intention to place an order soon for a new passenger boat of the wooden propeller type, to be adapted for summer and winter navigation. That she will be quite large is certain, but the dimensions have not yet been given out. A general rough plan for use in drawing up specifications will be made during the next few weeks, after which lake builders will be asked for estimates. So far as can be learned, the proposed new Graham & Morton boat, to take the place of the lost Chicora, has not made any further advance, but something may be expected soon.

The steamers Penobscot and Zenith City went into commission this week, as did also the ferry steamer Shenango No. 1. The Penobscot has gone to Duluth for grain, while the Zenith City is getting a crack load of ore from Escanaba for South Chicago. The Wisconsin & Michigan ferry boat has gone from Bay City to Port Huron to stop the leak which was made on the occasion of her launching, and will go to Lake Michigan in tow of the tug Perrett, which has been chartered for the season. It is reported that the Wisconsin Central people are figuring with James Davidson for a pair of ferry barges, but what use this road would make of them after it got them is a mystery, and the report has evidently grown out of a confusion of titles.

The Detroit Dry-dock Co. are trying to make up for delays in the arrival of material on the large steamer which they are building at the Wyandotte yards for the Cleveland & Buffalo Transit Co There are about 75 men employed in building the stern, independently of the rest of the boat, it to be joined to the main part of the hull as the latter is built. Large consignments of badly needed material are expected at the yard within a few days.

The schooner Tyrone will get away from the Globe shipyard today, going to Fairport behind a tug to take on her first cargo, coal. The Cleveland Ship Building Co. expect to deliver the Yale to her owners a week from Saturday.

The Hausler & Dunham Towing and Wrecking Co., of Chicago, announce their intention of building a new tug for service next season in the harbor at South Chicago. The new tug will measure 95 feet in length by 20 feet beam and 11½ feet depth, with 11 feet draft. The engine will be a fore-and-aft compound, measuring 18 and 26 by 30 inches, with an independent condenser, and having a universal coupling on the shaft. The boiler will be 14 by 9½ feet, tested to 150 pounds pressure.

The L. W. Knapp, a new fishing tug just built by Post & Durfee, was successfully launched at Richmond, O., opposite Fairport, last Thursday afternoon. She was built by C. M. Hemenway and is 63 feet long by 13 feet beam and 6 feet depth. She has a 13 x 14 engine, and has the boiler recently taken from the tug Star, was furnished insufficient steam and will in a short time be replaced by a new boiler of larger dimensions.

## GENERAL REPAIR WORK.

The Canadian steam-barge St. Magnus, which was calked up sufficiently to keep her afloat by the Cleveland Dry-dock Co. shortly after being raised in the main river, and which has been lying in the old river bed ever since, will probably soon receive further attention. Her owners, the McKays, of Toronto, have written Manager Brown, of the Cleveland dry-dock, that insurance adjustments had nearly all been settled, and that financial matters would soon be in such shape as to allow of her repair. The Pasadena was in this dock Tuesday and Wednesday getting her bottom calked, and the Wenona will go in to receive similar attention.

At the Ship Owners' dry-dock the steamer City of Genoa received a new wheel Wednesday. She struck her wheel against a log on Saginaw Bay on her trip up with such force that she almost stopped her engines. It is thought the blow broke the hub, for she dropped the wheel on Lake Superior on her way down. She also had her butts examined and some calking done. The Charlemagne Tower also received a new wheel this week. The schooner A. Gebhardt is at the dock and will go in to-day. She had a collision just outside Cleveland harbor with the Nellie Reddington a few nights ago, and had her stem broken and her anchor stock carried away.

CHICAGO.—The steamship Alva arr ved at South Chicago Sunday, and after discharging her ore cargo, went into dry-dock at the South Chicago yard. Adam Kiouku, an Indian diver at the Sault, worked 12 days under water putting the patch over the hold in the Alva, which was oval-shaped, and 16 feet in diameter, and the work is pronounced a masterpiece. It is expected that the repair work on the Alva may be finished this week, but it will cost about $5,000. The steamers Virginia and Indiana of the Goodrich line, were also in the South Chicago dock this week, having their bottoms overhauled.

At Miller Bros 's shipyard the barge S. M. Stephenson has been in dock to have a leak stopped; the steamer Joys to have a leak stopped and stern-bearings repaired; and the City of Kalamazoo to have her wheel fastened.

DETROIT.—At Clark's dry-dock the tug Peerless has been getting a new wheel, and the John J. Long had her bottom scraped. The car ferry Michigan Central has been getting a general overhauling at the Detroit dry-dock, and the steamer St. Paul has been having her forefoot repaired, a new piece of keel put in, and some calking done. At Oades' dock the pontoons of the Murphy Wrecking Co. have been recalked, the sand-sucker Mary got a new wheel, and Breyman's dredge No. 2 received some repairs. The government dredge Maumee has been having her hoisting gear put in shape here. The Frontier Iron Works are working on the machinery of the old Waldo Avery, which will soon come out as the Phœnix, and have furnished a new wheel to the Madagascar. The Newsboy received a new crank-shaft at the Riverside Iron Works.

BUFFALO —The steamer Montana which ran into the wrecked Britannic in Detroit River because of the absence of lights, smashed several planks and frames, and was repaired here at a cost of about $500. The excursion steamer Gazelle wa- in the Union dock to have a leak stopped and to receive some machinery repairs.

MANITOWOC.—F. & P. M. No. 5 is being ironed for the coming winter. Leathem & Smith are to tow the wrecked J. L. Hurd, which they recently purchased, to Manitowoc for a rebuild, which will cost several thousand dollars.

PORT HURON.—The Wisconsin & Michigan car ferry barge had repairs made her to stop the hole punched in her when she was launched. The machinery is being taken out of the Mineral Rock, and if the hull is found to be all right she will be used for a tow barge. Otherwise she will be laid out to bleach on Stag Island.

WEST SUPERIOR.—It is now expected that the repairs on the steamer Nyanza can be finished by the end of the month. The whaleback barge 117, which collided with the Alva in the Sault, completed repairs and left the American Steel Barge Co.'s yard Tuesday. It was not necessary for her to enter the dry-dock, and this reduced her repair bill considerably. She received 30 new plates, 7 frames and floors, new keelsons, lower deck and all crew fittings forward, the cost of repairs being about $4,000.

MILWAUKEE.—The steamer Kaliyuga came out of the Milwaukee Dry-dock Co.'s dock Tuesday. She received eight new bottom plank and a thorough recalking. Owing to the large number of lay-days in the dock, her repair bill will exceed $3,000. The Egyptian got a new stack here late last week. The steam-barge C. L. Young is having her upper works repainted. The Lycoming has been getting some repairs to her upper works

All charts of all portions of the lakes supplied promptly by THE MARINE RECORD, No. 144 Superior St.

## INTERNATIONAL WATER-WAYS CONVENTION.

The president and executive board of the International Deep Waterway Asociation have issued handsome invitations to the First Annual Convention, which will be held in Cleveland on September 24th, 25th, and 26th, beginning at 3 p. m. on Tuesday. The invitations bear the seal of the association, the features of which are the American and British flags crossed, and the motto, "United Effort—Mutual Benefit." Several thousand invitations have been issued, and are sent to delegates from each state, province, territory, city, town, universsity, board of trade, chamber of commerce, and commercial, trade or business body in the United States and Canada.

Generally, papers and discussions will be confined to the following topics:—

1. International Comity and Co-operation (President O. A. Howland's annual address.)
2. Progress of the Deep Waterway Movement (Annual Report of Executive Secretary Frank A. Flower.
3. Economics of Deep Waterway Transportation.
4. Ultimate Effect of Deep Water from the Great Lakes to the Sea: on (a) the Iron, (b) the Coal, (c) the Lumber, (d) the Grain and Flour, (e) the Cattle and Meat Business; (f) Shipbuilding, (g) Great Lakes and Ocean-Carrying Trade, (h) Railway Traffic and Earnings, (i) Lake-Board and Sea-Board Cities, (j) Agricultural Interests, (k) Domestic Iron Mining, (l) Iron and Steel Manufacturing.
5. Volume and Value of Commerce Tributary to an Enlarged Waterway System.
6. Cost, Character, and Utility of Existing Great Lakes, Champlain, and St. Lawrence River Improvements.
7. Control of the Outflow and Levels of the Great Lakes System.
8. Free or Toll Canals.
9. High Sea Regulations on the Great Lakes.
10. Effect of Deep Waterways on Marine Architecture.
11. Pneumatic and Hydraulic Locks.
12. Modern Methods of Excavation.
13. Is a Type of Vessel to Navigate Fresh and Salt Water practicable?
14. Comparative Study of Modern Ship Canals.
15. Government Policy as to Home and Foreign Canals.
16. Basis for International Co-operation in Canal Construction and Management.
17. Ultimate Development of Interior Water Transportation.

Copies of all papers and motions should be forwarded to the Executive Secretary, Mr. Frank A. Flower, West Superior, Wis., on or before September 10, 1895, for arrangement by the Executive Board.

So far as possible printed abstracts of papers will be distributed in advance so as to facilitate proceedings.

Names and addresses of deldgates, as soon as chosen, should be forwarded to the Executive Secretary.

The officers of the associa-ion for 1894-5 are as follows:—

International President, O. A. Howland, M. P. P., Toronto.

U. S. Vice President, L. E. Cooley, C. E., Chicago.

Canadian Vice President, James Fisher, Q. C. M. P. P., Winnipeg.

Executive Secretary, Hon. Frank A. Flower, West Superior.

Treasurer, Capt. J. S. Dunham, Chicago.

Executive Board—A. L. Crocker, chairman, Minneapolis; Frank A. Flower, secretary, West Superior; Capt. J. S. Dunham, treasurer, Chicago; James Conmee, Port Arthur; Hon. H. W. Seymour, Sault Ste. Marie; R. R. Dobell, Quebec; Thomas H. Canfield, Burlington Vt.; D. B. Smith, Toledo; Charles E. Wheeler, Cleveland; John D. Chipman, St. Stephen, N. B.; Hon. S. M. Stephenson, Marinette; William C. Sherwood, Duluth; Edwin H. Abbot, Boston; D. R. McGinnis, St. Paul; the president and vice presidents (ex-officio).

The headquarters of the President, Secretary, and Executive Board during the convention will be at the Hollenden, Cleveland.

THE U. S. Cruiser Brooklyn is so near completion that it is expected that she will be launched from Cramps' shipyard not later than the middle of September.

## IRON ORE PRODUCTION IN 1894.

Advance sheets of the report by Mr. John Birkinbine on the iron ores of the United States, contributed to the "Mineral Resources", volume 1895, give the following relative to the production during the past year.

The record of iron ore production in the year 1894, amounting to 11,879,679 gross tons, shows a slight advance (about 2½ per cent) over the quantity mined in 1893, but notwithstanding this the year 1894 can probably be recorded as the most unsatisfactory in the history of iron ore mining in the United States. The returns for 1893 indicated the smallest output from domestic iron ore mines since statistics have been collected by the United States Geological Survey.

The total reported valuation of the 11,879,679 gross tons of iron ore produced in the year 1894 was $13,577,325, or an average of $1.14 per ton, showing a decrease from the low price of 1893 ($1.66 per ton) of 52 cents, or 31.33 per cent. The greatest falling off in price was apparently in those states embraced in the Lake Superior region, the iron ore mined in Michigan being stated to be worth on an average $1 32, that in Minnesota 73 cents, and that in Wisconsin 92 cents per ton in 1894, as against $1.84, $1.55 and $1.33 in 1893, a decrease of 28.26 per cent, 52 90 per cent and 30.83 per cent respectively.

The decline in values of Minnesota ores is especially remarkable, the price at the mines being less than one-half of what was reported in 1893. This is due to the cheap mining on the Mesabi range, and to the fact that in order to obtain a foothold in the market it was thought wise to sell these comparatively little known ores at lower prices than the standard ores. While the reported value of Vermillion range iron ore of Minnesota is lower than in 1893, it is considerably higher than that mined on the Mesabi range in the same state.

In Alabama the average value of the iron ore in 1894 was slightly less than in 1893, being 83 cents per ton, against 86 cents in the previous year, a loss of but 3 cents, or 3.49 per cent. There is, however, more attention being paid to the grading of ore which is used in the furnaces, and it is probable that the ores smelted in 1894 were better prepared than in previous years.

Twenty-four states and territories produced 11,879,679 gross tons of iron ore during the year 1894, of which 9,347,434 tons, or 78.68 per cent, were red hematite; 1,472,748 tons, or 12.40 per cent, were brown hematite; 972,219 tons or 8.18 per cent, were magnetite; and the balance, 0.74 per cent, was carbonate ore.

Pennsvlyania, New York and Colorado are the only states which reported mining the four classes of iron ore in 1894; Virginia and West Virginia, Kentucky and the Western States furnished three kinds; Michigan, Alabama, Tennessee, Georgia, North Carolina and Missouri two kinds; the balance of the states are credited with one kind of ore only. In some cases admixtures of the ores above mentioned were mined but not reported separately. In 1894 there were produced 14,804 tons of magnetically concentrated ore, and 72,312 gross tons of jigged and hand-sorted ore.

The prevalence of red hematite ores in the Lake Superior region with a high percentage of iron has permitted mining and conveying them long distances with the exceptional appliances in use, while an abundance of less desirable red hematite close to fuel in Alabama and Tennessee has assisted in keeping this class of ore in favor.

From some mines brown and red hematite, or red hematite and magnetite, or carbonate and brown hematite ores are obtained out of the same workings, the extent to which ores are hydrated or weathered tranferring them from one class to another; or different classes of ore are found intermixed or alternating in the same deposit. Wherever possible an attempt has been made in the statistical review to separate into classes the different ores coming from the same workings, but in some instances this was impracticable, and the product is credited to the predominating character of ore mined. The aggregate production by states in 1894 was as follows:

| States. | Gross tons. |
|---|---|
| Michigan | 4,419,074 |
| Minnesota | 2 968 463 |
| Alabama | 1 493,086 |
| Virginia anc West Virginia | 600 562 |
| Pennsylvania | 532,087 |
| Wisconsin | 347 501 |
| Tennessee | 292 831 |
| New Jersey | 277.483 |
| Colorado | 250,199 |
| New York | 242,759 |
| Georgia and North Carolina | 174,694 |
| Missouri | 81 926 |
| Ohio | 58,493 |
| Montana, New Mexico, Nevada and Utah | 44.138 |
| Kentucky | 42 548 |
| Connecticut and Massachusetts | 30,259 |
| Texas | 15 361 |
| Maryland | 7 915 |
| Total | 11,879 679 |

Although the restricted operations of the year 1894 affected the more prominent iron ore mines or mining operations, these were, as a rule, equipped with more improved machinery and labor-saving devices, and some of them commanded greater capital than the smaller mines; hence mining was continued, although in some instances considerable ore was stocked. The statistics show that in 1894 44 mines produced 9,134,207 gross tons, or 76.89 per cent. of the total iron ore output of the entire country in 1894.

## BITUMINOUS COAL ANALYSIS.

The relative rates of coal mining in the Pittsburg railroad district and in the Ohio and Indiana bituminous field has always been something of a knotty question. In connection with railroad rates on coal, this matter has brought out unlimited discussion. The following figures, showing a comparative analysis of the various coals in the districts mentioned, thickness of the seam worked, and other particulars collected by Mr. R. J. Bailey, are quite interesting in view of the circumstances mentioned:

| State. | Average Thickness. | District. | Fixed Carbon. | Volatile Matter. | Ash. | Water | Sulphur. |
|---|---|---|---|---|---|---|---|
| Penn'a. | 4½ | Pittsburg | 57.88 | 38.40 | 2.68 | 1.04 | 1.25 |
| " | 4½ | Pittsburg | 58.90 | 34.60 | 4.60 | .... | 1.90 |
| " | 4½ | Pittsburg | 58.46 | 36.86 | 3.20 | .90 | .58 |
| " | 5 | Youghiogheny | 61.14 | 35.51 | 1.88 | 1.47 | 0.73 |
| " | 7 | Youghiogheny | 55.70 | 35.12 | 8.14 | 1.04 | 1.49 |
| " | 5 | Youghiogheny | 57.67 | 38.80 | 2.66 | 1.07 | 0.60 |
| " | 7 | Youghiogheny | 58.78 | 33.26 | 6.60 | .86 | .99 |
| " | 6 | Westmoreland | 59.22 | 33.73 | 5.12 | 1.25 | 0.66 |
| " | 6 | Westmoreland | 59.59 | 35.39 | 2.72 | 1.22 | 1.06 |
| Ohio. | 6½ | Nelsonville | 59.80 | 31.30 | 2.70 | 6.20 | 0.97 |
| " | 6½ | Nelsonville | 53.15 | 32.80 | 9.05 | 5.00 | 0.94 |
| " | 6½ | Haydenville | 63.49 | 30.12 | 1.09 | 5.30 | 0.64 |
| " | 6½ | Haydenville | 55.31 | 29.88 | 9.36 | 5.45 | 1.63 |
| " | 10 | Lost Run | 55.75 | 33.22 | 4.88 | 6.15 | 1.88 |
| " | 10 | Lost Run | 47.51 | 33.89 | 11.05 | 3.05 | 4.04 |
| " | 11 | Old Straitsville | 59.41 | 32.15 | 2.44 | 6.00 | 0.50 |
| " | 11 | Old Straitsville | 52.77 | 29.65 | 9.98 | 7.60 | 0.68 |
| " | 10 | New Straitsville | 60.45 | 29.20 | 2.95 | 7.40 | 0.93 |
| " | 13½ | Monroe | 53.50 | 28.30 | 13.30 | 4.90 | 0.79 |
| " | 11¼ | Sunday Creek | 58.17 | 31.40 | 5.09 | 5.34 | 0.88 |
| " | .... | Briar Hill | 62.66 | 32.58 | 1.16 | 3.60 | 0.85 |
| " | .... | Briar Hill | 60.40 | 29.10 | 6.60 | 3.90 | 0.82 |
| " | .... | Trumbull County | 64.30 | 30.19 | 1.95 | 3.65 | 1.02 |
| Indiana. | .... | Brazil Block | 53.99 | 38.76 | 1.80 | 5.46 | 0.75 |
| West Va. | 7 | Fairmont | 57.46 | 35.26 | 5.73 | 1.54 | 0.01 |
| " | 6½ | Fairmont | 56.56 | 36.78 | 8.40 | 1.42 | 0.71 |
| " | 7 | Tucker Co. | 67.18 | 26.84 | 3.50 | .80 | 1.16 |
| " | 7 | Tucker Co. | 72.76 | 22.90 | 2.79 | .96 | .59 |
| " | 4 | New River | 74.04 | 23.20 | 1.43 | .83 | 0.50 |
| " | 8½ | Pocahontas | 74.25 | 18.81 | 5.19 | 1.01 | 0.73 |

## ANOTHER RAPID PROPELLER.

A propeller invented by Ambroy B. Smith, of St. Paul, which the inventor claims will enable a steamer equipped with it to attain a practically unlimited speed, is a very simple contrivance, yet a marvel of ingenuity. Old steamboat men who have examined it express the opinion that the propeller will no doubt send a steamer through the water at the rate of 50 and perhaps 75 miles an hour.

There are three distinct inventions belonging to the propeller. First, there are the self-adjusting buckets or blades, so arranged that they have what are called a continuous pull, a square pull, and a push all at the same time, whether fully or partially submerged in the water. One or two wheels can be applied on each side of a vessel amidships, connected like the drive wheels on the locomotive and one or two wheels astern, although it is expected that one wheel on each side and one astern will produce a sufficiently high rate of speed.

The shaft, journal and roller bearings are new devices and important factors, and will, it is predicted, come into general use upon all steamships where great power and high speed are desired, and also upon stationary engines, locomotives, railway cars, street cars, etc. The pitman crank, etc., are also new features. All the improvements are being patented separately, but will belong to and be connected with the new propeller.

THE four books of "Sailing Directions," published by the Hydrographic Office, covering Lake Superior and St. Mary's River, Lake Michigan and the Straits of Mackinac and Lake Huron and Lake St. Clair with Detroit and St. Clair Rivers, north channel of Lake Huron and Georgian Bay, can be had at the office of THE MARINE RECORD, 144 Superior street, Cleveland. Price, $1.00 each.

## QUEER LAND AND WATER BOAT.

A nautical architect who bears the very appropriate name of Channel has invented a ship that he says will slip through the water at the rate of 75 miles an hour and will fly along over a good straight country road at a rate of 100 miles per hour. The sanguine inventor's full name is B. F. Channel, and he is a resident of Cambridgeport, Mass. He was born in England 35 years ago, but for some time has been a resident of this country. He has been engaged in the shipbuilding business since early boyhood and is confident that he is by no means a novice in the construction of water craft. The model of his wonderful craft resembles a sidewheel steamship, the wheels of which are immense and very powerful. These wheels are to be 25 feet in diameter, and their lower rims are even with the keel of the ship. They also project so far from the vessel on each side that Channel is confident they will steady it and preserve its equilibrium no matter what speed may be attained.

The wheels, Channel believes, will give the ship its extraordinary speed. They are 75 feet in circumference, are operated by two engines propelling separate shafts and may be made to revolve 100 times a minute, thus giving the ship a speed in the water of 7,500 feet per minute. On land, where the friction will be so much less, the inventor believes the speed will be greatly increased. A broad level turnpike, Channel says, may be utilized when his ship is sprinting across country at a mile and a half a minute, and when a curve is reached the inner wheel will be stopped, and the outer one will cause the ship to make the turn in safety. The wheels are rigged with paddle blades for use when the novel ship attempts the conquest of nature's domain.

Channel believes the war and navy departments should be greatly interested in his invention. The ordinary man-o'-war has to go half a mile to turn round, while Channel's boat can spin around like a top, delivering first one broad side and then the other.

## A NEW SUBSIDIZED LINE.

The legislation of the Austrian Government for the encouragement of shipping has practically led to the establishment of a new line of steamers from New Orleans to Austria. Steamships sailing under the Austrian flag are at present entitled to a subsidy which is calculated by the ton, and which in the case of a vessel of, say 1,500 tons, would amount to about £1,000. When, however, such vessels are employed, in a service which is acknowledged by the government to be of importance to the country they receive a further subsidy for every mile run, which in the case of a ship of the size required for this service would amount to about £2,000 a year. Thus vessels employed in the cotton trade of the American Gulf ports would be entitled to a subsidy of something like £3,500 per annum. The government admitted that a line such as was proposed between New Orleans and Trieste would come within the terms of the subvention clause. Several Austrian shipowners pressed the matter further by asking for an additional subsidy for these steamers to run between New Orleans and Fiume, and in this they have been successful.

## EXAMINING THE COLUMBIA.

At the New York Navy Yard the board of survey appointed to examine the Columbia in the dry-dock to ascertain what damage, if any, she sustained from faulty dry-docking while abroad, has been busy at work. The board consists of Commo. T. O. Selfridge, Chief Engr. E. Farmer and Naval Constr. F. T. Bowles, and finished its labors on Wednesday last. The finding of the board is not known, but the opinion is that the injury was found to be trivial and confined to some indentures in the keel between the frames of the hull. A second board, it is expected, will be appointed to determine how long it will take to make the defects good. How long the Columbia will remain in dry-dock was not known at last accounts, but the opinion was expressed that it would be some little time if repairs to her keel are to be made. On the other hand, if the report of the board who examined the keel of the vessel finds nothing of a serious nature, then she will probably join the squadron under Adml. Bunce in a few days. Repairs to her rudder were being made on Aug. 15, and new grate bars were being put in her furnaces.

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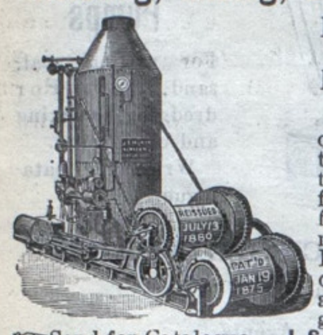

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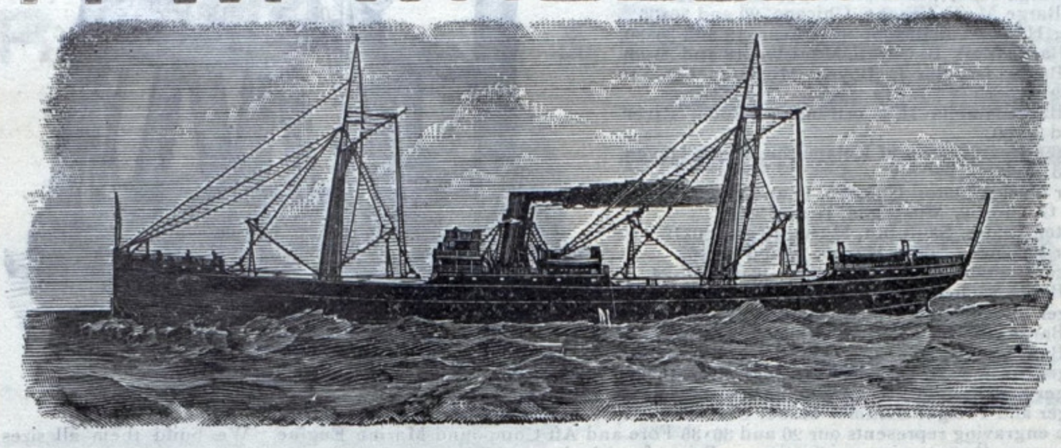

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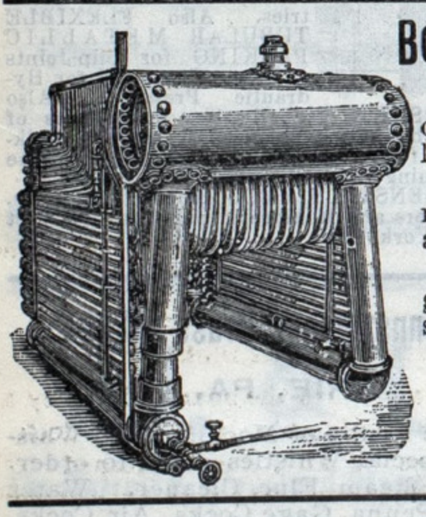

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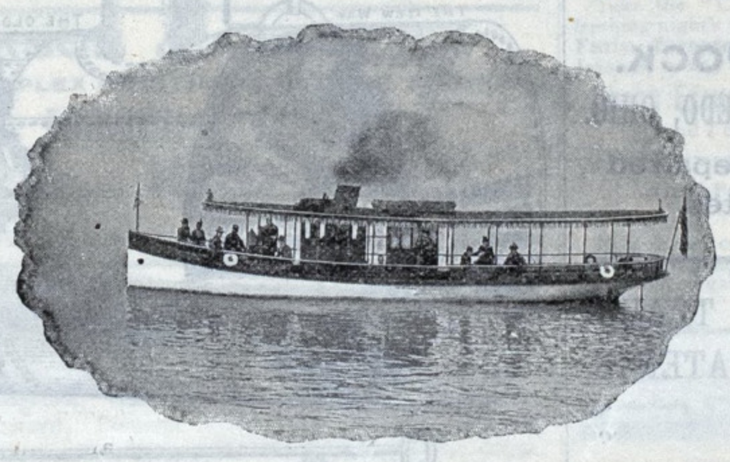

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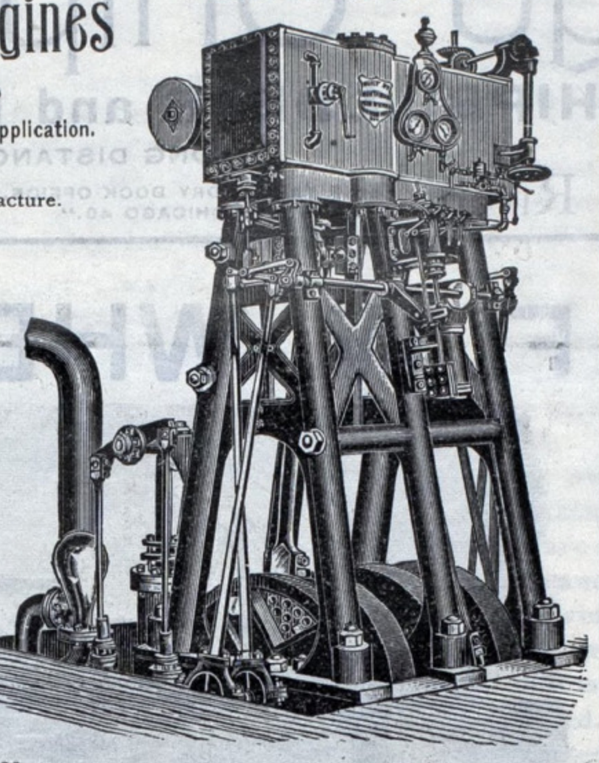

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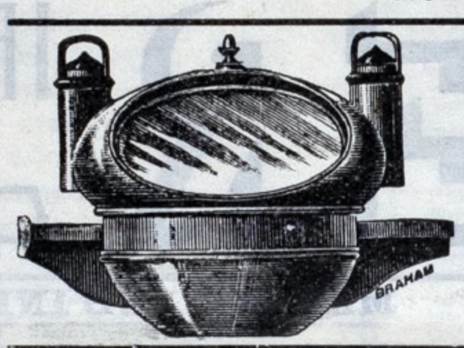


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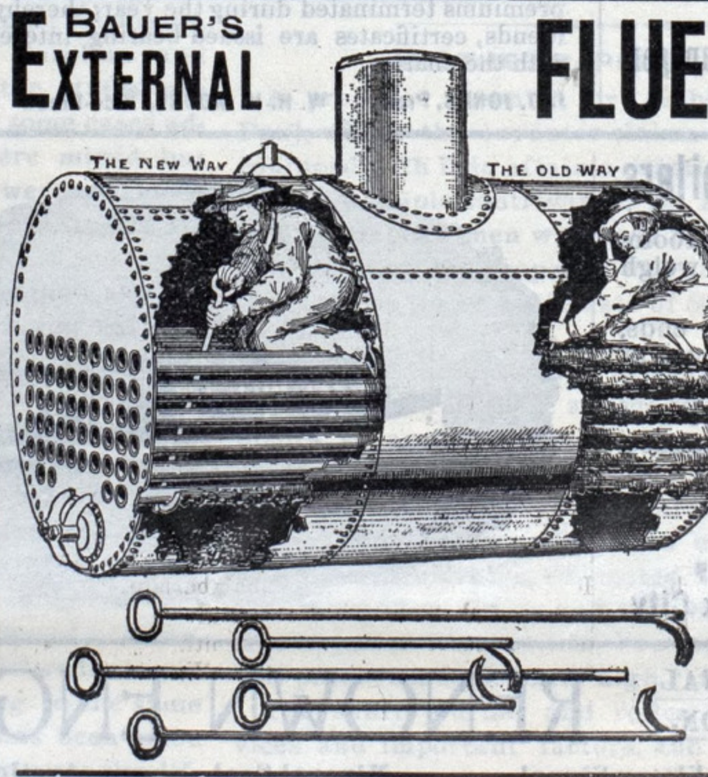


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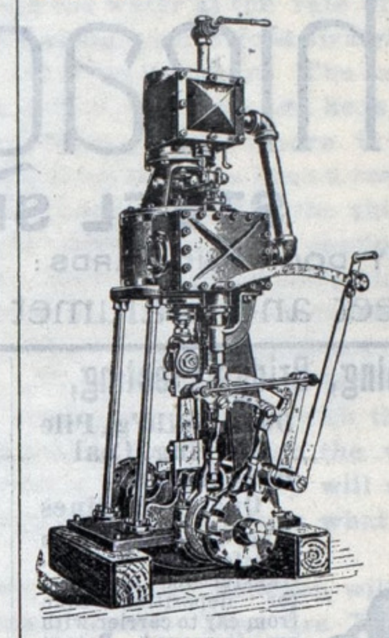

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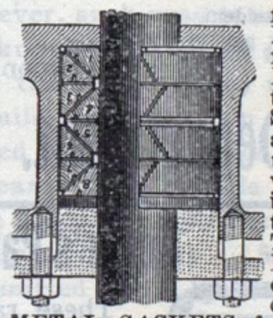

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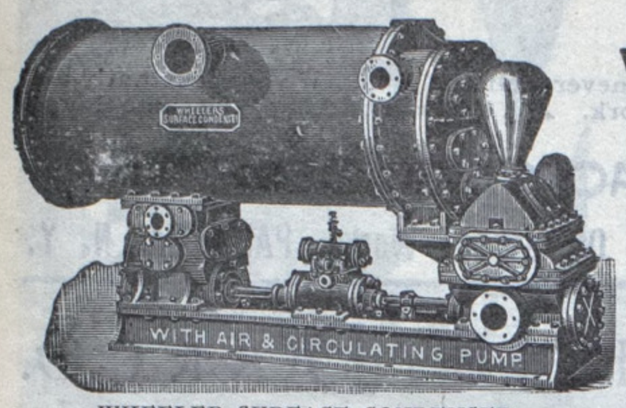


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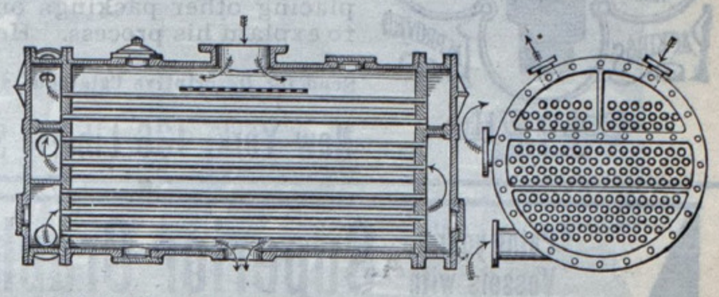

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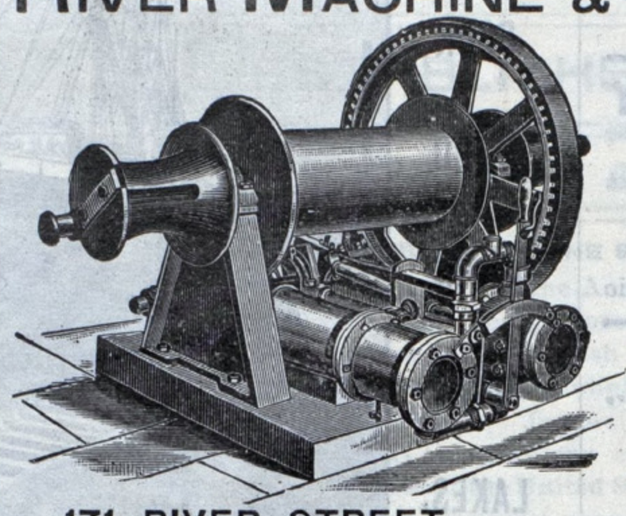

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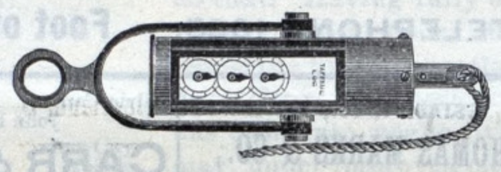

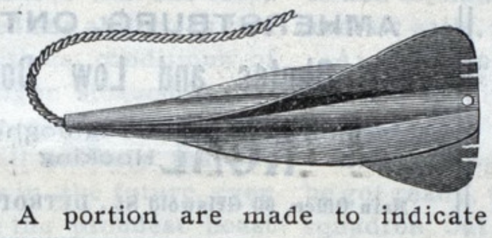

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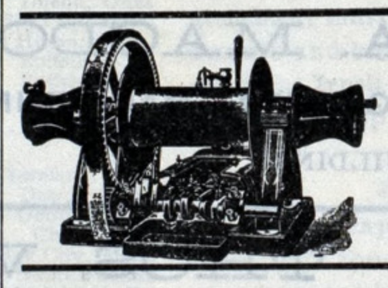

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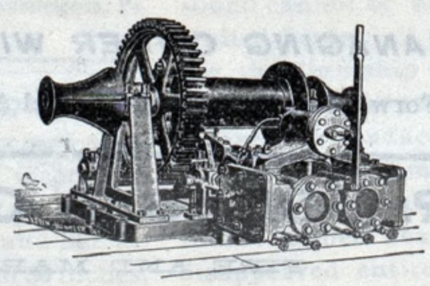

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Our Hoists will be found on the following boats: Tugs—Superior, Sumner, Sweepstakes, Winslow, J. K. Emmett, Acme, Mockingbird, Waldo Avery, Reliance, John Owen, Charlton, Howard, Duncan City, Chamberlain, Balize, Sampson, Westover, Gladiator, W. B. Castile, Home Rule, Robert Weideman, Boscobel and Peter Smith; Propellers—Metamora, Abercom, Penobscot, J. J. McWilliams, I. W. Stephenson, John W. Pauly; Barges—Jenness, Noquebay, Manta ee. Also in use by F. W. Wheeler & Co., W. B. City, Mich., Blood and Hart, Marine City, Mich., Michigan Salt Works, Marine City, Doty Bros., Pile Drivers, Toronto, Canada.

MARINE IRON CO., - - Bay City, Mich.

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## Nautical Watch Chain.

SOLID GOLD. SHIP-SHAPE IN EVERY DETAIL.

Sheaves work, snatch block opens out and seizings are passed correctly.

**MORGAN A. ROBERTSON,**
26 John Street, New York.

*Send for Descriptive Circular.*

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## PROPOSALS.

U. S. ENGINEER OFFICE, Newport, R. I. August 13, 1895. Sealed proposals, in triplicate, for the purchase from the United States of 1 tug, 1 dredge, 1 water boat, 3 dump-scows, and 1 sand-pump complete with boiler, will be received here until 12 o'clock, noon, September 19, 1895, and then opened. Full information furnished on application. W. W. HARTS, 1st Lieut., Corps of Engineers, U. S. A. 34–37

U. S. ENGINEER OFFICE, 34 West Congress St., Detroit, Mich., August 7, 1895. Sealed proposals for furnishing all Labor, Materials and Appliances for (a) Removing Shoals from West Approach, St. Mary's Falls Canal; (b) Removing Shoal from East Approach, St. Mary's Falls Canal; (c) Removing Shoals off Six Mile Point, Hay Lake, and (d) Removing Shoal 29, Section 4, Ship Channel, etc., will be received here until 2 p. m., September 6, 1895, and then publicly opened. All information furnished on application. O. M. POE, Col., Engineers. 32–35

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## Cleveland & Buffalo Transit Company.

**$2.50 CLEVELAND TO BUFFALO.**

VIA "C. & B. LINE."

Magnificent side-wheel steel steamers,

**"State of Ohio" and "State of New York"**

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SUNDAY INCLUDED.

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|---|---|---|---|
| Lv. Cleveland, | 6:00 p. m. | Lv. Buffalo, | 6:30 p m. |
| Ar. Buffalo, | 7:30 a. m. | Ar. Cleveland, | 7.30 a. m. |

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**Cheap Excursions Weekly to Niagara Falls.**

Send 4 cents postage for tourist pamphlet.

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Now under construction for this Company the largest side-wheel steamer on the Great Lakes, unsurpassed for speed and elegance, will be ready to go into commission April, 1896.

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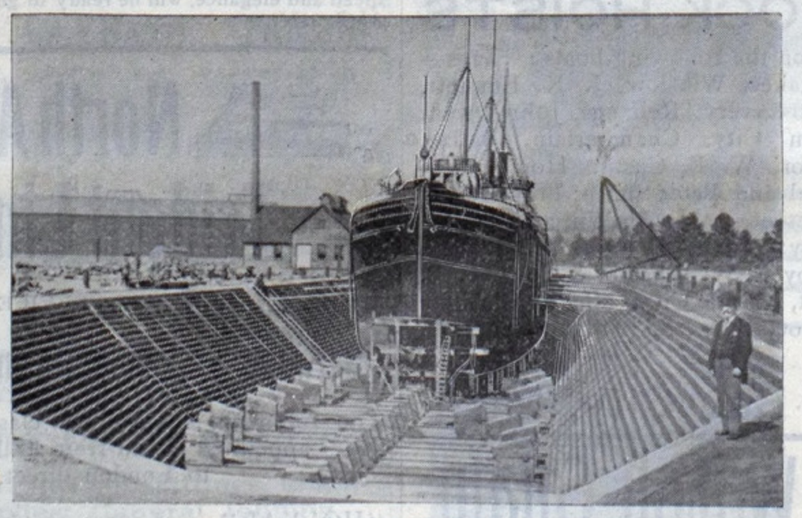

Best Quality of Oak in Stock for Repairing Wooden Vessels of all Classes.

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| Length, Extreme | 537 feet. | Entrance, Top, | 55 feet 9 in. |
| Breadth, Top, | 90 " 4 in. | Entrance, Bottom | 50 " |
| Breadth, Bottom | 52 " | Depth over Sills | 18 " |

LARGEST DRY DOCK ON THE LAKES.

PRICES FOR REPAIRS AND DOCKING SAME AS AT LOWER LAKE PORTS.

**SUPERIOR, WIS.**

A NUMBER OF PROPELLER WHEELS IN STOCK AT DRY DOCK.

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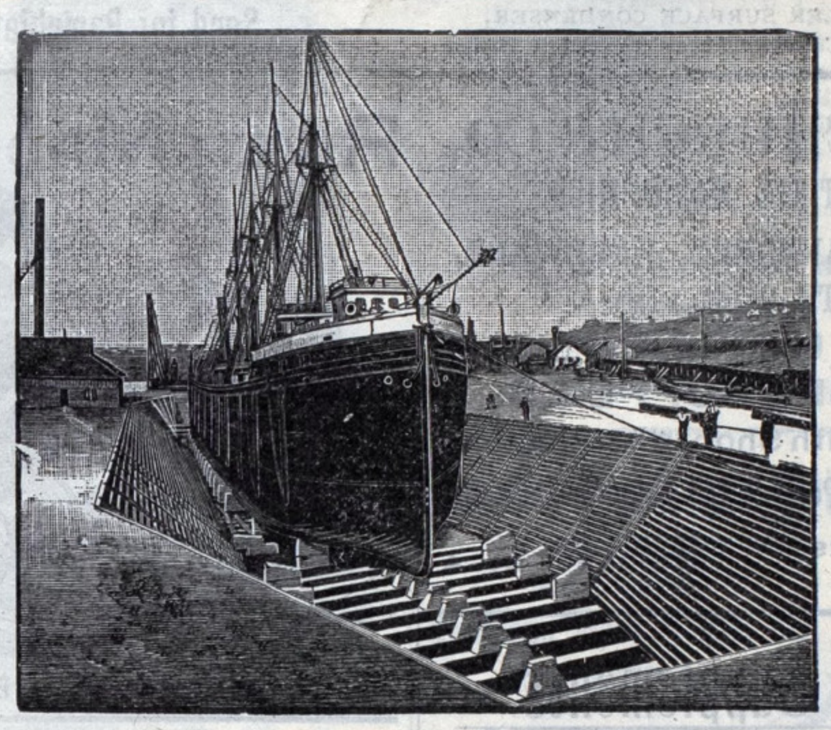

Capacity with Two Docks to Dock the Largest Ships on the Lakes.

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